REPORT RESUMES

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EDUCATIONAL SPECIFICATIONS FOR THE NORTH CAMPUS OF SEATTLE COMMUNITY COLLEGE.

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THE NORTH CAMPUS IS ONE OF THREE UNITS PROPOSED FOR THE SEATTLE COMMUNITY COLLEGE. A TEAM OF CONSULTANTS AND STAFF COMMITTEES DEVELOPED THIS DESCRIPTION OF THE BASIC EDUCATIONAL REQUIREMENTS FOR THE ARCHITECTURAL PLANNING OF THE CAMPUS. CONSIDERATION WAS GIVEN TO SITE PLANNING AND DEVELOPMENT AND TO FACILITIES FOR ADMINISTRATION, STUDENT PERSONNEL SERVICES, COLLEGE CENTER, INSTRUCTIONAL RESOURCES CENTER, COMMUNICATIONS, MATHEMATICS, COMMUNITY SERVICES, PHYSICAL EDUCATION, PERFORMING ARTS, ENGINEERING, ELECTRONICS, SCIENCE, BUSINESS, PERSONAL SERVICES OCCUPATIONS, FOOD SERVICE OCCUPATIONS, PUBLIC SERVICE OCCUPATIONS, GRAPHICS, SOCIAL SCIENCES, AND PLANT OPERATIONS. EACH SECTION INCLUDES APPROPRIATE TOPICS FROM THE FOLLOWING LIST--(1) PHILOSOPHY AND OBJECTIVES, (2) CURRICULUMS, (3) TEACHING AND LEARNING ACTIVITIES, (4) GUIDING PRINCIPLES, (5) STUDENT GROUPS, (6) FACULTY AND STAFF, (7) SPACE NEEDS FOR CLASSROOMS, (8) SPACE NEEDS FOR TUTORIAL LABORATORIES, (9) ENVIRONMENTAL AND UTILITY REQUIREMENTS, (10) INTERNAL FUNCTIONAL RELATIONSHIPS, (11) FUNCTIONAL RELATIONSHIPS WITH OTHER CAMPUS OPERATIONS, (12) EMERGING CONCEPTS AND DEVELOPING TRENDS, (13) MAJOR EQUIPMENT AND FURNISHINGS, AND (14) RECOMMENDED SPACE GUIDELINES. SPECIAL ATTENTION IS GIVEN TO AUDIOVISUAL FACILITIES. (WO)

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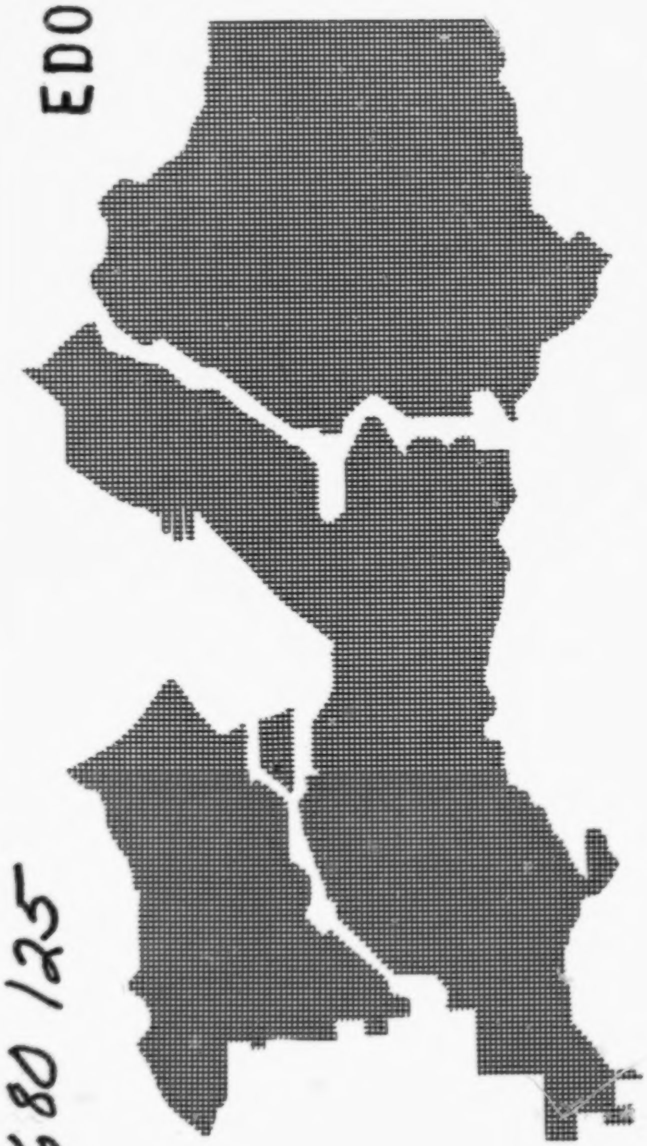

EDSPECS FOR THE NORTH CAMPUS SEATTLE COMMUNITY COLLEGE

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EDUCATIONAL SPECIFICATIONS
FOR
THE NORTH CAMPUS OF
SEATTLE COMMUNITY COLLEGE

**Prepared for the Board of Directors
of the Seattle School District**

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in
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Tallahassee, Florida
May, 1967

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Superintendent
Seattle Public Schools
815 4th Avenue North
Seattle, Washington 98109

Dear Mr. Bottomly:

We are pleased to submit to you the Report containing the Educational Specifications for the facilities proposed for construction at the North Campus of Seattle Community College. The final product is the result of considerable effort and time on the part of both the members of your staff and the Consultants. This Report purports to summarize basic curriculum and related decisions and presents a consensus on the basic requirements for facility needs. While it was humanly impossible to reflect in this Report each and every morsel of wisdom that was propounded in committee discussions, we do believe that the essence and intent of these discussions, for the most part, have been preserved.

This Report is another milestone in the process of planning the Seattle Community College. As the planning proceeded through this stage, there was evidence of the development of a more mature concept on the part of all as to what Seattle Community College is and should be and what purposes it should serve. Hopefully, this maturing process will continue to evolve better solutions to the myriad of problems that usually beset the planning and development of a large urban institution such as yours. We hope contributions of your Consultants to this process have fulfilled your greatest expectations.

We express our sincere appreciation to you and to your staff for the finest cooperation and assistance during the development and preparation of this Report.

Sincerely yours,

C. W. McGuffey
Executive Director

CWM:pd

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I

INTRODUCTION

Purpose of the Study

The purpose of this Report is to present a written summary of the discussions and deliberations of the more than eighty committee meetings of the faculty and staff of Seattle Community College and the Consultants. This Report purports to state the basic educational requirements for planning the physical facilities needed to implement the program of instruction and services to be offered at the North Campus of Seattle Community College. Not all of the many valuable suggestions, concepts and ideas proposed in the numerous meetings could be included; however, it is believed that the materials discussed herein provide a satisfactory basis for the architectural planning of the facilities to be constructed on the North Campus.

Specifically, the purpose of this Study was to prepare a statement of educational specifications to include the following:

1. A review and summary of the philosophy and objectives of each major segment of the educational program of the College.
2. A review and summary of the curricular implications for facilities.
3. A description of the general nature of the functions and activities of the various instructional and non-instructional functions to be accommodated by the College.
4. A description of the emerging concepts affecting each major segment of the instructional program of the College.
5. An estimate of the kinds of facilities and the number needed to accommodate the program of instruction and services to be provided by the College.
6. An estimate of the square footage requirements for the various types of facilities as guidelines to the architects.
7. Suggestions as to the amount and type of major items of furniture and equipment needed.
8. A description of the facilities that are suggested for the program of instruction.

9. A description of the desirable space relationships of facilities suggested.
10. A schematic diagram of functional relationships of major space components recommended.

Planning Dimensions

Several considerations established the conceptual framework for the preparation of the educational specifications. These considerations were conceptualized as planning dimensions and served to give general direction to the planning process.

The Long-Range Plan

The estimate of enrollments, the number of rooms and the types of spaces as outlined in the Long-Range Plan for Seattle Community College established the guidelines for the planning committees. In some cases, departures from these guidelines were justified and new limits were agreed upon. The long-range plan projected three campuses, each having an enrollment of 5,000 full-time equivalent students. An enrollment of sixty per cent college parallel and adult general and forty per cent occupational education in the day program was projected.[1]

A Comprehensive Community College Campus

The planning group agreed that a comprehensive community college is essential to serve Seattle's needs for both out-of-school and post-high-school education. Further, it was agreed that each campus should be comprehensive as well. There was general consensus that "When all of the educational needs—occupational, college parallel, basic education, and community service—are being met on a single college campus, then that campus is 'comprehensive' in nature."[2] The curricular and course offerings would not be the same on each campus. Further, no student would be restricted to attendance at a single campus so that the curricula and courses at any campus would be available to him.

A Multi-Campus Concept of Organization

Seattle Community College has been planned as a multi-campus college. The College's pattern of organization has been conceived as a multi-branch type of plan. The Seattle School District, as the parent system, anticipates the operation of a single legal institution with three and ultimately more comprehensive campuses. A college president equal in rank to a Deputy Superintendent of Schools is responsible for the administration of the College, and he reports through the District Superintendent to the Board of Directors of the Seattle School District. Campus heads will report to the President and will be higher in rank than the administrators on the President's staff. While this report is being written, a law is being prepared to change the organizational pattern for the operation of the college. Eventually, this law is likely to change the relationship of the College Staff with that of the District Staff.

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[1] Associated Consultants in Education, Inc., *Long-Range Planning for Seattle Community College,* the Consultants, Tallahassee, Florida.

[2] Seattle Community College, *A Recommended Plan for Articulating the Instructional Program in Seattle's Comprehensive Community College,* Seattle Public Schools (February, 1966), p. 6.

The Community College Student

Community college students vary widely in their characteristics. No other educational institution has a more diversified student body. No other group of students has more diverse backgrounds nor more diverse personal goals. Generally, the community college receives two broad groups of students—college age youth and adults.

Studies of community college students provide an estimate of the characteristics of the students who may attend Seattle Community College. A study of the characteristics of students enrolled in the community colleges in the State of Washington in 1964 found that:

1. 63.1 per cent were male and 36.9 per cent were female.
2. Approximately 61 per cent of the total were enrolled as full-time students carrying at least ten quarter hours of work.
3. Part-time students tend to be older while full-time academic students tend to be younger.
4. Vocational students tend to be older and are more likely to attend on a part-time basis.
5. The proportion of women tends to be greater than men in the part-time and the vocational programs.
6. Recent high school graduates tend to be in academic programs with declared intents to attend four-year colleges in the future.
7. The median age for part-time students was 25.6 years for males and 31.9 years for females.[3]

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[3] Alan W. Metcalfe, *Community College Student Characteristics Research Report 01-05*, State Superintendent of Public Instruction (1965), 34 pp.

A recent Florida study of community junior college students showed that community college students vary greatly in age, ability, economic status and in many other characteristics. Selected characteristics of community college students identified in the Florida Study are as follows:

1. Seventy-four per cent of the students enrolled in Florida community colleges earned test scores in the twelfth grade which would have qualified them for entry into the public supported universities of Florida.
2. Twenty-six per cent of the students enrolled in Florida community colleges are married.
3. Fifty-nine per cent of the students were men and 41 per cent were women.
4. Fifty-eight per cent of the students work while attending the community college.
5. Thirty-seven per cent of the students reported they would need financial assistance in order to complete their education.
6. Fifty-two per cent were full-time students and 48 per cent were part-time or unclassified students.
7. Follow-up studies made of full-time students who enrolled as freshmen in the Fall of 1959 indicated that (a) 33 per cent graduated on time in 1961, (b) 21.5 per cent transferred to a college or university after graduation, (c) an additional 9 per cent transferred to a college or university prior to junior college graduation, and (d) forty-two per cent dropped out prior to the completion of their programs.[4]

Other studies show that the part-time and unclassified student is likely to be an adult, is more mature and has more seriousness of purpose than the college-age student. The adult student views the college as a means of realizing his long-range personal and vocational goals. Generally, they have little or no interest in extra-curricular activities, athletics or other activities outside the classroom.

College-age students enter the community college not knowing what to expect. Their high school experiences are very recent. Many are unrealistic about their occupational goals and their ability to succeed in academic work. Most will enter the college parallel program with the intent to pursue the baccalaureate degree. These students are influenced greatly by their parents in the selection of their courses of study. During the period of attendance at the community college, the college-age youth will discover their individuality, and many will select a marriage partner. Obviously, the many personal and emotional problems faced by the college-age student during this period place heavy responsibility on the community college.

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[4] State Department of Education, *Five Years of Progress, Florida's Community Junior Colleges*, Tallahassee, Florida (1963), pp. 20-25.

What is the college-age student like? Most feel that their success is assured. Boys measure success in terms of good paying jobs, while girls measure it in terms of the family. The majority rebel against organized society in one form or the other. Most seem to want what their parents want; although they do not consider possessions as symbols of success or virtue. They seek something more than possessions. Success, to these youth, must be personal, important to themselves.

About 42 per cent of teenagers smoke and about 54 per cent drink. Most want to see changes made in U. S. society, particularly in the areas of sexual morality, civil rights and politics. They want "more discussion, more disagreement and more democracy" in the United States.

The planning problem is one of defining the physical requirements so that a diverse student body can be given unity and so that the individual social, emotional, academic, psychological and occupational education needs of each student are met.

The College's Plan for the Articulation of Instruction

The planning team has used a document prepared by the staff of Seattle Community College as the basic philosophical guide to the development of the educational specifications for the North Campus. Working definitions of terms were also borrowed from this compilation of objectives, programs and definitions.[5]

Commitment to Change

The planning team's commitment to change is a thread that runs throughout this Report. To be realistic, change is the only certainty that exists; therefore, in order to design a good educational facility, the architect must understand that one of his roles is that of coordinating the physical needs of the present with the needs of the long-range future.

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[5] Seattle Community College, *Ibid.*, pp. 1-26.

Some Planning Concepts

A number of planning concepts were developed and accepted during the planning process. Some of the more pertinent ones are included in the following paragraphs.

Plan for Change

Because of the fact that the methods, hardware and curriculum content of education are continually changing, the process of planning to house future needs is largely a problem of designing the buildings and equipment for change. Building equipment as well as instructional equipment must be readily interchangeable with new up-to-date developments. Building services must be easily modifiable for modernization. The planning of building service systems must make interior spaces easily adaptable to new uses. Structural and service systems must make the continuous reorganization of interior space possible so that varying size groups of students can be accommodated as the need arises. Some spaces should be planned for reorganization at will, while others may need to be planned for rearrangement over a week end or during summer vacation. The architect must search out every conceivable means of accomplishing this objective if the plant is not to be obsolescent soon after occupancy.

The development of new programs of education usually involves a process of maturation over a given span of time. This is particularly true of the community college program which is clearly in an evolving state. This factor is of particular concern in this Study since facilities are being planned for an indeterminate future. For planning purposes, however, a starting point is to identify what is good practice *NOW*. In addition, one must make the best estimate of the probable direction that community college education will take in the *FUTURE*. Someone has said, "Coming events cast their shadows before them." If there is substance to this statement, it is important that the "shadows of the future" in community college education be identified and provisions made in the design of the plant to accommodate them. It appears quite obvious that it is a mistake to plan entirely for the *NOW*. It is perhaps an even greater risk to plan entirely for the *FUTURE*, since it is continually evolving and its direction is never completely predictable. The only certainty that can be depended upon is that community college education will change. Architectural solutions to this evolutionary process are neither simple nor easy. Catch words and phrases such as "flexibility," "adaptability," "malleable space," "instant space," and "no posts," are hardly adequate in conveying an understanding of the nature of the design problem to the architect. Each and every space must be described to the architect in terms of its use **NOW** and its potential *FUTURE* use. This requires that each space in the proposed plant be analyzed in terms of the functions it is to serve **NOW** and the evolving functions it is likely to serve *TOMORROW*. If the limits of physical change required of the plant are understood, it is more likely that such changes can be made possible by the architecture.

The concept of "flexibility" or the "no posts" philosophy cannot be relied upon alone to resolve the physical problem of changing educational programs. Such concepts will not hinder change. However, it is important that a college plant not only allow change to take place but to encourage change as well as give direction to desired change.

Multiple Use of Space

Economical planning would suggest that maximum use of space should be possible. In many instances, this can be accomplished by planning the same facility for use by more than one function. Efficient multiple use, however, will depend upon two critical factors; the attention to detail in the design of a particular facility and a facility location convenient to using functions.

Multiple use should never be forced at the sacrifice of the educational program. The compatability of the using functions must be considered as well as the extent to which compromises in space design will impair the educational program. Generally speaking, spaces for multiple use should be uncommitted in terms of design for a special purpose, thus permitting satisfactory interchangeable use for a sufficient number of functions to accomplish a high degree of space utilization.

Plan for the Day Program of the College

The college program of education and services anticipates a year-round and round-the-clock attendance by students. Generally speaking, only a minimum attempt has been made herein to meet the specific needs of night-time students. Some modifications to space for daytime programs have been provided for occupational extension and apprentice related programs. However, the major consideration in the planning process has been to provide for the anticipated needs of the daytime enrollment.

It is important that the architecture of the College recognizes the need for creating both a daytime and a night-time environment. Although the daytime environment is affected by the character of the physical surroundings that encompass the area, the night-time "image" of the campus, perhaps, should be a world unto itself, created for its impact on students and their behavior. Perhaps an environment could be created that would make the student awsomely aware of his destiny as a human being and as a contributor to a great civilization. Careful study and a concerted effort should be made to create a meaningful environment for both day and night.

High Visibility Areas

Throughout this Report, reference has been made to "high visibility" areas. The purpose of the planning team has been to suggest that both the activities and the interior facilities in selected laboratories and classrooms should be visible to the passing student traffic. The openness created by large panels of glass in many spaces could serve as a continuing display of the activities of the college. For example, the operation of a potter's wheel in an art laboratory is a fascinating activity to watch. Students could become aware of what other students are studying and perhaps could become interested in exploring more widely the curriculum of the college.

Integration of Educational Functions

The planning team has been guided by a commitment to fuse the diverse elements of the educational program of the College into a meaningful set of educational experiences for all students and to truly implement the concept of a comprehensive community college. Our society is characterized by diversity rather than conformity, yet there are unifying elements in our society which give it purposefulness and unity. Similarly, Seattle Community College seeks a unifying element in its architecture that gives common purpose and unity to its educational program. Facilities alone cannot accomplish this goal; however, it can provide the matrix of physical conditions to facilitate the achievement of this purpose by the grouping, the location and the design of facilities. Perhaps even more important is the image projected to the student by the design of the college plant. This image should project that the College is one institution and that its purpose is to serve all students to the end that individual needs are met.

Procedures Used

The educational specifications were prepared as follows:

1. Groups of educational functions and services were identified as

components of the total college program, and committees of staff and faculty were organized around this structure.

2. Consultants were assigned to each committee. The consultant assumed the leadership role of the committee, leading discussions and giving direction to the committee process. A set of guidelines on the number and types of rooms and an estimated amount of space were given to each committee as a basis for its discussions.
3. Each committee met at least twice, and some met three or more times to discuss philosophy, objectives, teaching and learning activities, and courses and course content as a basis for the development of facility needs.
4. The consultants summarized the committees' discussions and prepared the final educational specifications.
5. A steering committee, called the "General Planning Concepts Committee," made general policy decisions and reviewed all final statements of educational specifications.

Planning Focus

The facilities planning for Seattle Community College should reflect the vigor, the vitality and the dynamics of a growing institution. Although the College serves a variety of educational goals and needs, the architecture of the College plant should serve as a vital force to give unity to the diversity that its educational program represents.

A continuous search has been made for the "big idea" in every function that could give vitality to the planning of the College. From the beginning the focus of the planning has been the student. A continuous search has been conducted to find answers to the all important question, "How can the physical plant truly reflect the dignity and excellence of the role of each individual regardless of the curriculum he follows?" To fail to recognize the overriding importance of every human personality and to fail to reflect the development of this personality as a value in itself would be a gross planning failure. Therefore, it is of immeasurable importance that the architecture for Seattle Community College reflect the dignity of the individual, that it highlight the American heritage and that the future be a focal point in the search for a better life for the students through education.

The Community College, then, should provide the climate in which each student attending is stimulated to grow to his fullest as an individual—intellectually, vocationally, physically, socially, culturally and spiritually. The college environment should stimulate interest in our cutural heritage; encourage an understanding of other nations and their cultures; and assist students in becoming more effective citizens, neighbors and family members.

To accomplish this goal the campus planning must depart from traditional planning practices by fusing the "liberal arts" and "the trades" into a unified concept of physical form. It is no longer sufficient that one should tolerate the "liberal arts" on the one hand and "occupational education" on the other; thereby, relegating the facilities for occupational education to the "lower campus." Both must be accepted as essential interlocking dimensions of our present day culture. The achievement of this goal in planning should enable the student, through continuous interactive experience with his contemporaries and with his day-to-day formal and informal educational experiences, to discover for himself a more meaningful life, to gain a better understanding of his heritage and to develop greater aspirations for the future of himself and his fellow man.

Implementation

The product of this effort is but another step in the evolving process of implementing the educational plan for Seattle Community College. Hopefully, this document will become the means whereby the educational program of the College is translated into a facility to house its activities. The edspecs are not intended to restrict the architect in his creation of the physical form of the college campus but to provide him the basis for creating not only a physical image but also a functional tool of education. The lack of tradition in community college planning leaves the architect free to exercise his imagination and to create new designs and concepts unique to the community college.

The space estimates included herein are intended as guidelines to the architect. Furthermore, the edspecs generally represent a stage in the process of maturing concepts about curriculum, curriculum change and space requirements. In this evolutionary process, hopefully, maturation will continue to develop and new and better solutions will evolve from this experience.

II

SITE PLANNING AND DEVELOPMENT

Purpose

The purpose of campus planning is to project an orderly pattern for the development of the physical facilities of the college. A well-conceived plan will give unity to campus development and provide a logical pattern for the growth and expansion of the college without impairing the educational programs of the institution.

The purpose of this section is to provide some guidelines and to suggest some considerations that are primarily educational in character, yet are significant in the planning and development of the proposed campus.

Guidelines for Site Planning and Development

Seattle Community College is a commuter-type institution. This fact suggests certain conditions that will have implications for site planning and development. Students will walk, drive their own cars or ride public transportation to the campus. Many students will spend all day on campus while many others will attend for just a few hours during some part of the day or evening. Students ranging in age from 16 to 75 will be taking courses varying in length from a week or two to two full years or longer. A wide range of interests and abilities as well as a variety of long-term educational and occupational objectives will be served by the college. The facilities at this institution will be operated 18 hours per day and, in some instances, 24 hours while serving multiple groups of students.

Planning experience has evolved some general principles which should serve as guidelines in planning for the development of the community college campus, and practice has evidenced the need for these. These are as follows:

1. The facilities for administrators whose primary responsibility is to the public should be located for easy public access and visual prominence from the public approach to the site.
2. The instructional resources center should occupy a place of prominence in the overall layout of buildings and should be conveniently accessible from primary pedestrian arteries.

3. Buildings serving community functions should have easy public access from adequate parking areas.
4. The college community center should be located for easy student access, and service should be provided by reasonably short and direct vehicular service drives.
5. The location of noisy and quiet functions on campus should avoid the unnecessary interference of a noisy activity with a more quiet one.
6. Buildings requiring vehicular service should be arranged for convenient access and made accessible from drives and parking areas.
7. Playing fields, outdoor athletic areas and swimming pools should be conveniently close to indoor physical education facilities and have direct access to shower and locker areas.
8. Buildings housing mechanical facilities for heating and other utilities should be located so as to provide for the economical distribution of the heating medium through utility lines to the buildings served. Adequate provision should be made for vehicular service to the mechanical building.
9. Utility lines should be placed underground and planned for easy expansion to handle future development requirements.
10. Vehicular traffic should be confined to the periphery of the site leaving the interior of the campus to be planned exclusively for pedestrian use.
11. Vehicular traffic should be planned so as not to interfere with instructional activities and should be located so as to avoid unsafe crossings with pedestrian traffic.
12. Probable future enrollment and curriculum expansion should be accommodated by the preparation of an open-ended development plan and the designation of uncommitted space on the site.
13. Probable concentrations of pedestrian traffic should be identified and traffic flow patterns developed to permit easy movement about the campus via wide pedestrian walks.
14. Extensive night use of facilities requires that well-lighted pedestrian walks and parking areas be provided.

The community college campus must be planned first and foremost with a deep concern for its occupants, the students. Each student's attitudes, his feelings and moods, his appreciation for the institution and his morale can all be influenced by the impact that the facilities make on him.

Outline of Facility Needs

Table 2.1 includes a summary of facilities requirements for the North Campus. The outline in Table 2.1 consists of the space needs for the various functions, services and instructional fields to be provided by the college.

TABLE 2.1
SUMMARY OF SPACE GUIDELINES FOR THE NORTH CAMPUS, SEATTLE COMMUNITY COLLEGE

Administration	9,910
Student Personnel Services	6,880
College Community Center	33,320
Instructional Resources Center	40,080
Oral and Written Communications	16,120
Mathematics	7,120
Community Services	7,460
Physical Education	40,060
Auditorium for the Performing Arts	13,180
Music	8,520
Drama	9,210
Art	8,270
Electrical. Electronics and Pre-Engineering	35,610
Science Instruction	39,430
Business, Commerce and Business Administration	31,170
Personal Service and Related Occupations	9,555
Building Construction and Pre-Engineering/ Pre-Architecture	25,230
Paramedical Occupations	15,310
Food Service and Related Occupations	13,420
Social Sciences	13,310
College Developmental Program	9,750
Public Service Curricula	2,190
Graphics and Mass Media	15,520
Plant Operations	24,940
Total	435,565
Gross (1.54 X Net)	670,770

Factors Affecting Facility Relationships

In the day-to-day operation of the college, there are certain considerations in the physical location of college activities and functions that can enhance the effectiveness of instruction and promote the efficiency of the administration of the total college program. Some general guidelines are as follows:

1. Noisy functions, the noise from which cannot be suppressed by control techniques, should be located away from relatively quieter areas.
2. Facilities for activities or functions which require common administrative coordination should be grouped together.
3. Facilities for functions which require service access from a service drive should be located on or near the periphery of the site.
4. Facilities for functions which service the public should have direct access from approach drives and parking areas.
5. Facilities for functions with a high demand rate for parking, day and evening, should be located near or adjacent to parking facilities.
6. Facilities for functions with a high usage rate by students; e.g., the college community center and the instructional resources center, should be located on or very near the main pedestrian traffic arterial on the campus.
7. In the grouping of functions into common building units, their compatibility with regard to noise level, generation of odors, need for outside vehicular service, multiple use of common spaces, should be a major consideration.
8. Areas of "high visibility" should be located on the main pedestrian traffic arteries of the campus.
9. Functions which are likely to expand should be located so as to make needed expansion possible.
10. All facilities should be integrated into a plan that represents a concept of total unity. No one phase of the college program should be identified with any particular sector of the campus.
11. Space organization and arrangement should facilitate close student-professor relationships while providing a friendly informal atmosphere.

More specific criteria regarding the location of specific facilities are discussed in the chapters dealing with specific services and instructional functions. These are not repeated here.

Diagram of Facility Relationships

The diagram shown in Figure 2.1 is a schematic configuration which is intended to express in a general way the desired facility relationships of the various functions and services of the North Campus of Seattle Community College. The components of the schematic diagram *do not* represent buildings; they *do* represent major functions.

The purpose of the diagram is to show the desired general relative placement rather than actual locations of the various facilities.

Major Planning Problems

A number of major problems relate to planning the site. The site, restricted in size and rather long and narrow in shape, contributes to, rather than reduces, the planning problem.

Approach and Access to the Site

Students will come to the site from all directions. Students from the north will reach the site via Burke, Meridian and Aurora. Those from the east will reach the site via the overpass at 92nd Street or the one at 110th Street. Those from the south will reach the site via the freeway interchange at North 85th Street or local streets such as Meridian and Aurora Avenues. Students coming from the west will use local streets to 95th or 110th Streets.

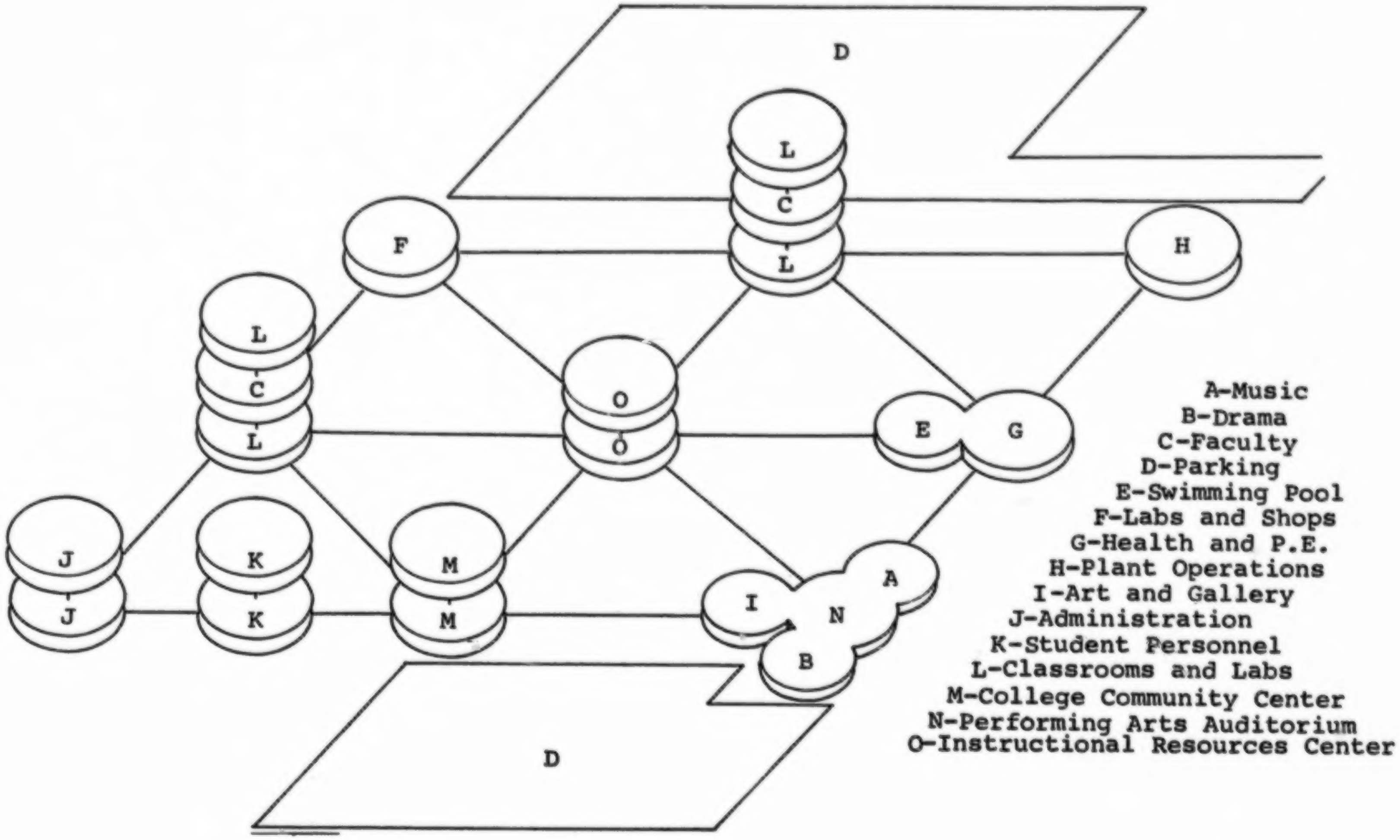
The data on distribution of high school graduates suggest that approximately 25 per cent would come from the north and another 25 per cent from the east, 23 per cent from the south and the remaining 27 per cent from the west.

Public Transportation

At the present time, public transportation to the area in North Seattle in which the site is located is satisfactory. However, it is conceivable that student demand could serve as a means of further improvement in the service to this area. No estimates are available on the number of students

FIGURE 2.1

GENERALIZED RELATIONSHIPS OF MAJOR EDUCATIONAL AND SERVICE FUNCTIONS, NORTH CAMPUS, SEATTLE COMMUNITY COLLEGE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A-Music
B-Drama
C-Faculty
D-Parking
E-Swimming Pool
F-Labs and Shops
G-Health and P.E.
H-Plant Operations
I-Art and Gallery
J-Administration
K-Student Personnel
L-Classrooms and Labs
M-College Community Center
N-Performing Arts Auditorium
O-Instructional Resources Center

who might ride public transportation. Factors such as bus schedule, frequency of runs and convenience of transportation to place of residence will influence the number of riders. However, it is the considered judgment of the planners that minimum use will be made of public transportation facilities.

Utilities

These services are available in the area and no major problems are anticipated in obtaining these services. Perhaps the cost of extending these services will be the major considerations.

Physical Education Spaces

The edspecs suggest that approximately 15 acres of land are needed for the physical education program. This includes land area for a broad program which will eventually develop.

Parking

The community college serves a commuting population. Students will have to drive, walk or use public transportation to reach the college campus. Present trends in auto ownership by college-age students indicate that a large percentage of the student population will drive to school and require parking accommodations. Many colleges are planning a parking space for each full-time equivalent day student. Others are providing spaces at a rate of approximately 60-75 per cent of the full-time equivalent day students.

This problem has been discussed at length and its various aspects analyzed. There seems to be general consensus that parking accommodations should be provided at no cost to the student, if possible; otherwise, at as little cost as possible.

Adequate and convenient parking accommodations for the students at the North Campus of Seattle Community College would require between 3,750 and 5,000 parking spaces. Acreage requirements would be 25 and 33.3 acres for 3,750 and 5,000 cars respectively. The acreage proposed for the North site is approximately 65 acres. With 33 acres of parking and 15 acres devoted to physical education space, only 17 acres would remain for buildings, service drives and open areas. It would appear that some sort of compromise plan is necessary to solve the parking problem.

Several alternatives are possible; however, the consultants suggest the following be considered:

1. Construct parking spaces for 3,000 cars.

2. Seek the cooperation of the Seattle Transit System to schedule buses to the campus at frequent intervals and at convenient times for student use.
3. Work with students to organize a car pool system and the joint use of rides to the campus. Issue parking permits to groups of students who register for a car pool. Car pools could be voluntary or assigned by the administration or both.
4. Seek legislative authority to permit the college to sell revenue-producing bonds to build parking garages for the additional spaces needed — the cost to be amortized by the rental of parking spaces to students.

Site size requirements for this approach are as follows:

(1) to park 3,000 cars	20.00 acres
(2) edspecs for P. E.	15.00 acres
(3) building space (two story building)	7.25 acres
(4) open space service drives, courts, walks and landscaped areas	22.75 acres
Total Acreage	65.00 acres

III

FACILITIES FOR ADMINISTRATION

Introduction

The purpose of administration in a community college is first and foremost to promote and support the instructional program. Administrative activities should facilitate teaching by the faculty and learning by the students if it is to perform its functions in a satisfactory way. The community college exists to be of service to people, and administrative services must facilitate this objective.

The functions of administration are classified as follows:

1. Instructional leadership
2. Business and fiscal affairs
3. Student welfare
4. Staff recruitment and management
5. Public relations
6. Research and development
7. Facilities planning and plant management

It is the mission of administration to coordinate these functions. The manner in which these functions are coordinated, the people involved in the coordination process and the level at which coordination takes place have implications for facilities planning.

Organization for Administration

In order to accomplish its mission, the community college must have an orderly plan for performing its work. An orderly plan requires organization, lines of authority, assignment of responsibility, levels of hierarchy of command, adequate communications, group participation and unity of command.[1] It is not the purpose here to elaborate on these requirements

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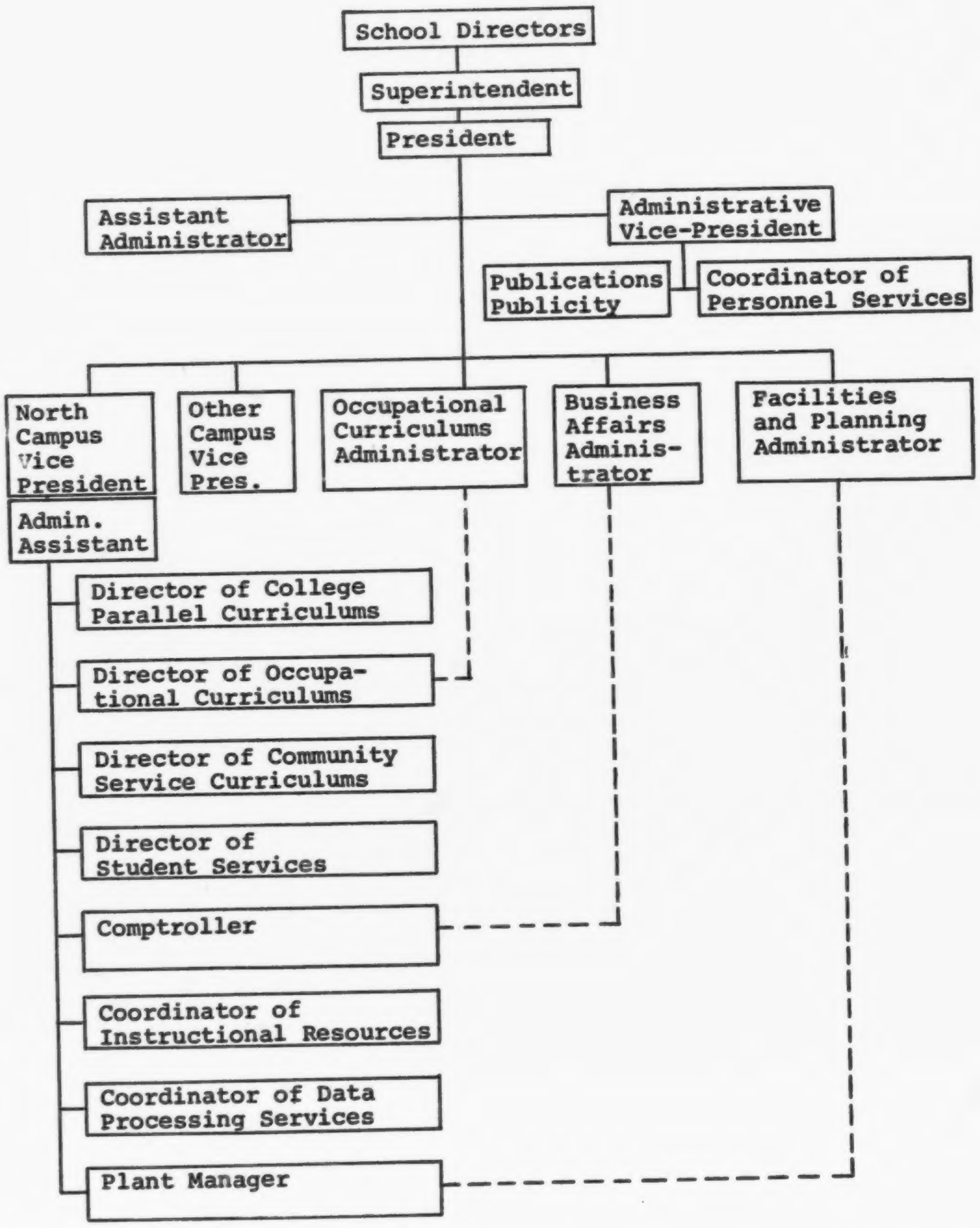
[1] HEW, *Guide to College and University Business Management*, Superintendent of Documents, Washington, D. C., pp. 11-14.

FIGURE 3.1

COLLEGE ADMINISTRATION CHART FOR SEATTLE COMMUNITY COLLEGE SYSTEM


School Directors
Superintendent
President
Assistant Administrator
Administrative Vice-President
Publications Publicity
Coordinator of Personnel Services
North Campus Vice President
Other Campus Vice Pres.
Occupational Curriculums Administrator
Business Affairs Administrator
Facilities and Planning Administrator
Admin. Assistant
Director of College Parallel Curriculums
Director of Occupational Curriculums
Director of Community Service Curriculums
Director of Student Services
Comptroller
Coordinator of Instructional Resources
Coordinator of Data Processing Services
Plant Manager

Source: Records of the Seattle Community College. Revised 12-12-66.

but to point out that there should be an organizational plan which meets these criteria.

Figure 3.1 purports to show the administrative organizational plan for Seattle Community College.

Although still subject to further development, the organizational plan for Seattle Community College which has been formulated provides for the coordination of functions and activities among the President, the members of the central staff and those charged with responsibility for administration on each individual campus.

Personnel to be Housed

It is anticipated that positions and their concomitant responsibilities comparable to those shown in Figure 3.1 will be established for the North Campus. Table 3.1 lists position titles, number of persons and a brief statement of duties and responsibilities for administrative personnel on the North Campus.

TABLE 3.1

NUMBER AND TYPES OF ADMINISTRATIVE PERSONNEL TO BE ASSIGNED TO THE NORTH CAMPUS OF SEATTLE COMMUNITY COLLEGE

Position Title	No. of Persons	Duties and Responsibilities
Campus Vice President	1	Act for the President in the administration of campus affiairs. He is the Chief Administrator on the campus and is responsible for implementing college policy. All personnel on the campus will report, directly or indirectly, to the Vice-President.
V. P. Secretary	1	Handle correspondence, phone calls, screen and receive visitors, schedule conferences for the Vice President.

TABLE 3.1 (Cont'd)

NUMBER AND TYPES OF ADMINISTRATIVE PERSONNEL TO BE ASSIGNED TO THE NORTH CAMPUS OF SEATTLE COMMUNITY COLLEGE

Position Title	No. of Persons	Duties and Responsibilities
Administrative Assistant to the Vice President	1	Handle details and special assignments such as public information.
Secretary to the Administrative Assistant	1	Secretarial duties.
Director of College Parallel Curriculums	1	Supervise instructional progress under his jurisdiction. Formulate recommendations with division heads regarding staffing, scheduling, use of facilities, types and amounts of teaching supplies, evaluation and improvement of instructions, encourage innovations and experimentation in education.
Secretary to Director	1	Handle correspondence, phone calls, screen and receive visitors, schedule conferences for the Director, etc.
Assistant Directors	2	Assist the Director in carrying out his responsibilities.
Secretaries to Assistant Directors	2	Similar to duties of other secretaries.
Director of Occupational Curriculums	1	Supervise instructional program under his jurisdiction. Formulate recommendations, etc. (See duties of Director of College Parallel Curriculums).

TABLE 3.1 (Cont'd)

NUMBER AND TYPES OF ADMINISTRATIVE PERSONNEL TO BE ASSIGNED TO THE NORTH CAMPUS OF SEATTLE COMMUNITY COLLEGE

Position Title	No. of Persons	Duties and Responsibilities
Secretary to Director	1	Secretarial duties.
Assistant Directors	2	Assist the Director in carrying out responsibilities.
Secretaries to Asst. Directors	2	Secretarial duties.
Director of Community Service Curriculums	1	Supervise day and evening, basic studies, and community services area of instruction and program. Provide leadership in promotion of community services, supervise the development and direction of a continuing education. Recruit and supervise all instructors in the evening, continuing education and basic studies programs.
Secretary to Director of Community Service	1	Secretarial duties.
Assistant Director (Day)	1	Assist the Director for day program.
Secretary to Assistant Director	1	Secretarial duties.
Assistant Director (Evening)	1	Assist the Director of Community Services with evening school program.

TABLE 3.1 (Cont'd)

NUMBER AND TYPES OF ADMINISTRATIVE PERSONNEL TO BE ASSIGNED TO THE NORTH CAMPUS OF SEATTLE COMMUNITY COLLEGE

Position Title	No. of Persons	Duties and Responsibilities
Secretary to Assistant Director	1	Secretarial duties.
Director of Student Services	1	Planning, supervision and direction of a program of student personnel services. Plan and direct a testing program. Supervise student records, provide for admission and registration of students, administer and supervise the counseling program. Administer scholarship program. Advising and placement.
Secretary to the Director	1	Secretarial duties.
Assistant Directors of Student Personnel Services	2	Assist the Director.
Secretaries to Assistant Directors of Student Services	2	Secretarial duties.
Comptroller	1	Collection of student fees and other income, budgets, purchasing, payroll, encumbrances, storage and inventory control, mail-incoming and outgoing, internal accounts, directs accounting records and procedures.
Assistant for Campus Business Activities	1	Assist the comptroller with on-campus business affairs.

TABLE 3.1 (Cont'd)

NUMBER AND TYPES OF ADMINISTRATIVE PERSONNEL TO BE ASSIGNED TO THE NORTH CAMPUS OF SEATTLE COMMUNITY COLLEGE

Position Title	No. of Persons	Duties and Responsibilities
Secretarial and Clerical Staff	10	Provide secretarial and clerical services to the business office.
Coordinator of Instructional Resources	1	Supervise and administer the overall organization of the IRC; provide leadership in development of communications media, administer book collection policy and maintain total collection of materials.
Coordinator of Data Processing Services	1	Coordinate and supervise the campus installation of data processing services.
Plant Manager	1	Supervises the care and operation of the physical plant; supervises security and safety resources, traffic and parking; assists with budget preparation; schedules work and directs work activities of custodians.
Secretary to the Plant Manager	1	Secretarial duties.

Room Requirements and Recommended Space Guidelines

Table 3.2 contains information regarding space requirements for the administration of the program at the North Campus of Seattle Community College.

TABLE 3.2

RECOMMENDED SPACE GUIDELINES FOR FACILITIES FOR ADMINISTRATION AT THE NORTH CAMPUS, SEATTLE COMMUNITY COLLEGE

Type of Space	Number	(Net Area)	
ADMINISTRATION			
Campus Vice President			
Vice President's Office	1	400	
Administrative Assistant's Off.	1	200	
Toilet	1	24	
Secretary (2) and Reception	1	225	
Storage	1	27	
Conference Room (20) Capacity	1	400	
Coffee Bar	1	24	
Sub-Total			1300
Staff Lounge with Coffee Bar	1	524	
Staff Workroom	1	240	
Sub-Total			764
Director of College Parallel Curriculums			
Office	1	225	
Secretary's Office	1	150	
Storage	1	25	
Sub-Total			400
Assistant Director's Office	2	240	
Secretary's Office	2	160	
Storage	1	25	
Sub-Total			425

TABLE 3.2 (Cont'd)

RECOMMENDED SPACE GUIDELINES FOR FACILITIES FOR ADMINISTRATION AT THE NORTH CAMPUS, SEATTLE COMMUNITY COLLEGE

Type of Space	Number	(Net Area)	
Director of Occupational Curriculums			
Office	1	225	
Secretary's Office	1	150	
Storage	1	25	
Sub-Total			400
Assistant Director's Office	2	240	
Secretary's Office	2	160	
Storage	1	25	
Sub-Total			425
Director of Community Service Curriculums			
Office	1	225	
Secretary's Office	1	150	
Storage	1	25	
Sub-Total			400
Assistant Director's Office	1	120	
Secretary's Office	1	120	
Storage	1	25	
Sub-Total			265
Director of Student Services			
Office	1	225	
Secretary's Office	1	150	
Storage	1	25	
Sub-Total			400
Assistant Director's Office (Day)	1	120	
Secretary's Office	1	120	
Storage	1	25	
Sub-Total			265

TABLE 3.2 (Cont'd)

RECOMMENDED SPACE GUIDELINES FOR FACILITIES FOR ADMINISTRATON AT THE NORTH CAMPUS, SEATTLE COMMUNITY COLLEGE

Type of Space	Number	(Net Area)	
Assistant Director's Office (Eve.)			
Office	1	120	
Secretary's Office	1	120	
Storage	1	25	
Sub-Total			265
Stenographic Pool for Administrative Offices			250
Comptroller			
Business Office	1	150	
Secretary's Office	1	150	
Lobby-Counter and Staff Space			
Outer Lobby	1	100	
Counter	1	50	
Inside Service Area	1	120	
Counting Room	1	96	
Accounting Room	1	120	
Clerical Desk Area	1	214	
Storage	1	36	
Vault	1	100	
Mail Room	1	750	
Receiving Room	1	450	
Sub-Total			2,336
Coordinator of Data Processing Services[a]			
Coordinator's Office	1	120	
Secretary's Office	1	120	
Storage	1	25	
Systems Analyst	1	80	
Programmers	2	160	
Keypunch Operators	2	80	
Machine Operators	4	160	
Sub-Total			745

TABLE 3.2 (Cont'd)

RECOMMENDED SPACE GUIDELINES FOR FACILITIES FOR ADMINISTRATON AT THE NORTH CAMPUS, SEATTLE COMMUNITY COLLEGE

Type of Space	Number	(Net Area)	
Plant Manager			
Manager's Office	1	(b)	
Secretary's Office	1	(b)	
Storage	1	(b)	
Printing and Duplicating Room	1	600	
Storage	1	100	
Sub-Total			700
Telephone Service Room	1	300	
with Operator	1	150	
Sub-Total			450
Information Center	1		120
Total			9,910

[a] Located adjacent to the instructional facilities.
[b] Shown elsewhere in this report.

Description of Facilities

Vice President's Office

The Vice President's office should have a space of 400 square feet (net). There should be a large double pedestal desk with an "extend-a-top" plus a matching credenza, a suitable office chair and four side chairs (all upholstered), two matching smoking stands, and a coat and hat closet. There also should be a matching filing cabinet. There should be a television, a telephone and electrical outlets. The office should be paneled and carpeted.

In the Vice-President's office there should be a matching conference table with three suitable ash trays and ten (10) upholstered chairs. This conference table will be used for small meetings called by the Vice President.

There should be a toilet room connected with the Vice President's office and also, if possible, connected to the Conference Room.

Conference Room

A paneled conference room should be connected with the Vice President's office with a conference table and 20 upholstered chairs. There also should be a kitchenette (coffee bar) in the Conference Room adjacent to the wall next to the office. This room should also open into the hallway for outside access. This Conference Room will be used by the Vice President for meetings with the Directors and other administrative officers including, at times, the Division Heads. Certain citizens' committees of the college may meet in this room as well as committees of the faculty and students which can be scheduled by appropriate staff members. This room should be carpeted. Provide for a telephone outlet. A built-in screen, electrical outlets and a chalkboard are needed.

Vice President's Secretary and Reception

The secretary's office should have a connecting door to the Vice President's office, one to the corridor, and one to the Administrative Assistant's office. Two double pedestal secretaries' desks and chairs and four side chairs should be in the office. A storage cabinet (built-in), approximately 2′ x 10′ or 2′ x 12′ with doors and adjustable shelves, should be provided. Filing cabinets will also be required. A telephone outlet should be connected with the Vice President's and the Administrative Assistant's offices. The room should be carpeted.

Administrative Assistant's Office

This office should contain a double pedestal executive type desk, upholstered office chair, three (3) side chairs, a smoking stand, a 6′ x 8′ book case with adjustable shelves, filing cabinet, clothes rack and telephone. The room should be carpeted. Television outlets should be provided.

Staff Lounge with Coffee Bar

A lounge is needed for the staff members, secretaries and clerks, etc. in the administrative offices. Comfortable and appropriate lounge chairs and coffee tables, pictures, mirrors, smoking receptacles and lamps should be the furnishings. There should also be a coffee bar (kitchenette) similar to that in the Vice President's Conference Room. Telephone service should be provided.

Staff Workroom

A staff workroom for use by the administrative staff should be located nearby for ease of access to administrative personnel. A counter height cabinet with formica top and sink should be located on one wall of the room. This cabinet should have adjustable shelving for storage of supplies for duplication, etc. There should be work tables, chairs and duplicating equipment along with other equipment such as a collator, staplers, spiral binders and paper cutter. The sink should be equipped with hot and cold water. There should be 6 feet of tack board and 6 feet of chalkboard on the walls.

Printing and Duplicating Room (Campus Communications)

This room will function as the space for the printing and duplication of routine and some special printed releases from the Vice President's office. This function will be under the supervision of the Administrative Assistant. This room should be equipped with work counter, sink, cupboard storage, work tables, a table model offset and table, a mimeograph machine and table, a photocopier, folding machine and automatic collating machine. A small storage room should be located adjacent to this room. Telephone should be provided.

Director of College Parallel Curriculums

This office should be furnished with a double pedestal desk, office chair, three (3) side chairs, two smoking stands, bookcase for 400 books with adjustable shelves, 4′ of chalkboard, filing cabinets, clothes rack and telephone. The room should also contain a small conference table and six chairs. The floor should be carpeted. Television outlet should be provided. Intercom facilities to the secretary's office and assistants' offices are desirable.

Secretary's Office

Double pedestal secretary's desk and chair, three (3) side chairs, storage cabinet approximately 2′ x 12′ with doors, adjustable shelving for supplies and possibly college catalogs. There also should be a filing cabinet and a telephone connected with the Director's office. Doors should connect to the hall and to the Director's office. Carpeting should be provided.

Storage and Work Area

The storage and work area should be located adjacent to the secretary's office, be separated visually and acoustically from it and have an access door to it. The room should be provided with a work counter with sink and running water. Cupboard storage both above and underneath the sink should be provided. Adjustable 10″ shelves should be installed along one wall. This room should also accommodate a ditto or spirit duplicator, a photocopying machine and a collator.

Other Directors and Assistant Directors

The other Directors' offices and Assistant Directors' offices: Director of Community Service Curriculums, Assistant Director's Office; Director of Student Services and his Assistant's office; and the Plant Manager's Office are to be similar to that described for the Director of College Parallel Curriculums. Similarly, the secretaries' offices for the other directors and assistant directors are to be similar to the office described for the secretary of the Director of College Parallel Curriculums. A work and storage area should be provided for each Division Director which is similar to that described for the Director of College Parallel Curriculums.

Stenographic and Duplicating Pool

The Secretarial Pool should contain space for three secretaries with appropriate secretary desks and chairs and one side chair for each desk. A small work table should be included. There should be 6 feet of tack board in the room. A telephone should be located in this space. Electrical outlets should be provided for typewriters.

Comptroller's Office

The office of the Comptroller and his secretary's office should be similar to the offices for the other directors and their secretaries. If possible, the secretary's office should be accessible both to the lobby and to the clerical desk area.

The 700 square feet of lobby space is to include a counter (27″ wide) across the space with gate entrance at one end of the counter to the space behind the counter. A minimum of 5′ from the front wall of the room to the counter is to be used as lobby space with 6′ of working space behind the counter to be used as inside service area. The counter will have cabinet space underneath for supplies. This counter possibly should be enclosed with openings for service.

Adjacent to this service area behind the counter are to be several areas as follows:

(1) An enclosed area to provide a counting room in which to receive

all cash receipts such as tuition and fees; and daily receipts, such as the bookstore, cafeteria and vending machines. This room should have a double pedestal desk, office chair and a side chair. There also should be a 6′ table and chair and a coin counting machine. Accessible to this room should be a fire-proof safe.

(2) The accounting room (also enclosed) should have the equipment necessary for machine bookkeeping, desks, tables and chairs, and filing cabinets.

The clerical staff desk (open) area is for the 3 or 4 workers, part of whose duty is to wait on the students. This area should have secretarial desks and chairs; possibly, 4 side chairs should be provided.

(3) The store space of 48 square feet should be located in the clerical staff service area for office supplies.

(4) A records vault of 100 square feet should be located so as to be accessible to all of the areas in the business services space. This records vault should be fire resistant with a four hour rating, if possible.

(5) The receiving room should be connected by door to the secretary's office. This receiving room is for the purpose of receiving and storing certain supplies which will come to the business office rather than to plant operations.

Telephone Service Room with Operator

After conferences with the telephone company as to the type of telephone service which is to be used, the space for housing the needed equipment will be better determined. It is belived that not more than 300 square feet will be needed.

Information Center

Connected to this space should be an area of approximately 120 square feet for the operator and/or information booth, or office. This person (or persons) serving the information office will answer all telephone calls coming to the College as well as answer questions and give directions to visitors and others who may come into the administrative complex.

Mail Room

This room will serve as the central receiving and dispensing point of all incoming and outgoing mail. Approximately 400 mail boxes should be installed in the wall facing the lobby area leading to a corridor. Bins for storage of large packages should be installed. An open work counter that can be closed should be installed. Vehicular service access should be provided.

Functional Relationships of Space Components

Figure 3.2 includes a graphical representation of the functional relationships which are desirable in order to provide effective leadership to the College staff and faculty and to enhance communication between faculty and staff, administrators, students and the general public. The graphical representation divides the functions of administrators, faculty and staff as to whether or not their responsibility is primarily to the public (the outward look) or primarily to faculty or students (the inward look).

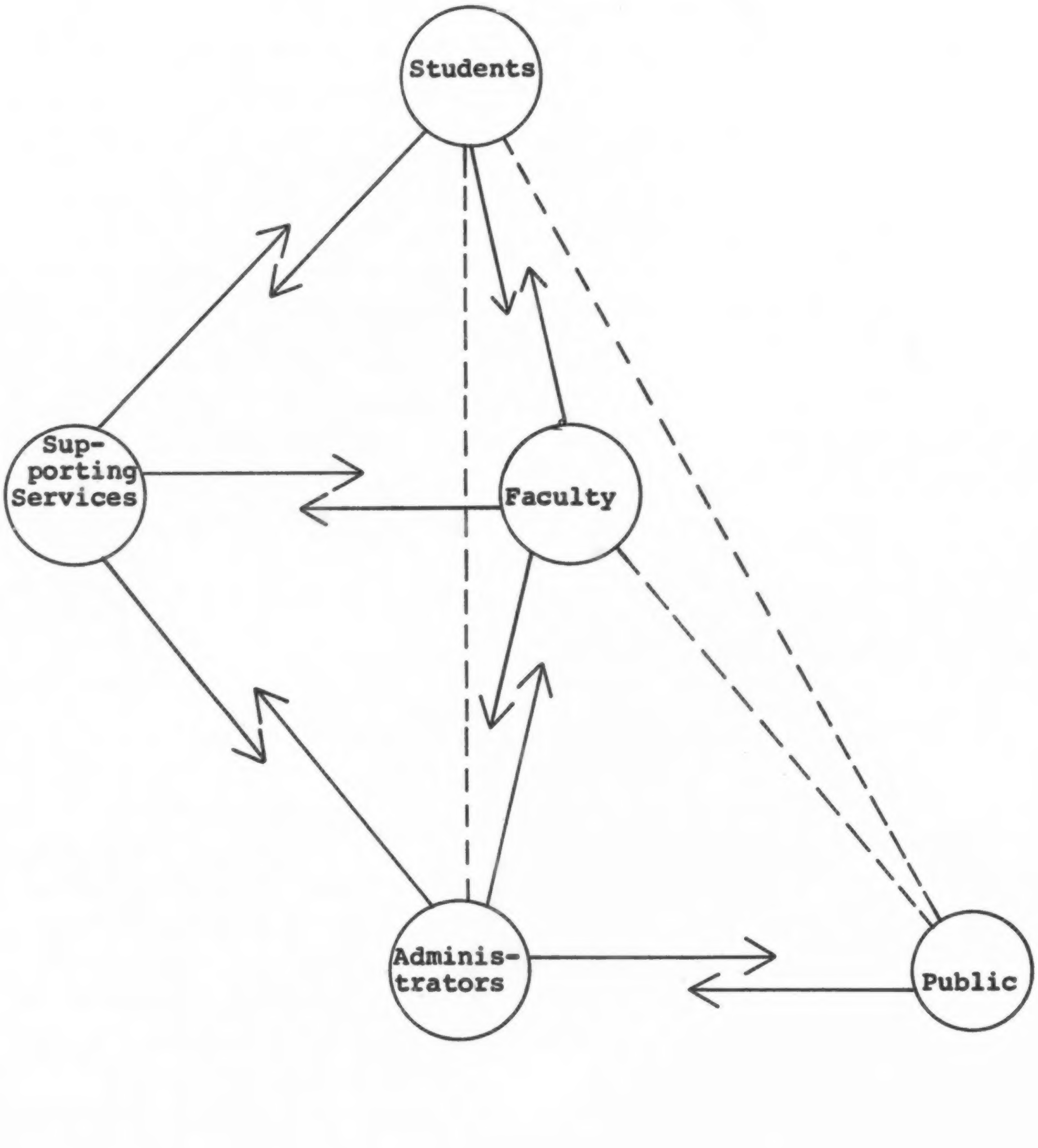
The following criteria are suggested:

1. Those administrators whose functions relate primarily to the public should be housed for easy access to one another and to the principal public approach to the campus.
2. Those administrators whose functions relate primarily to students should be housed for easy access to student activities and instructional areas.
3. Those administrators whose primary functions relate to faculty should be housed for ease of communications and personal contact avoiding, of course, identity with a particular division or department.
4. All faculty and administrators whose principal assignments involve the use of specialized space should be located in close proximity to it.
5. Recreational and social areas provided for faculty and administrators should be planned and located for inter-disciplinary contact and informal communication.
6. Faculty members and appropriate instructional administrators should be housed so as to enhance personal contact, communication and self-identification within their administrative unit.

The following lists the administrative personnel and staff according to whether their prime responsibility is to the public or to the faculty and students.

FIGURE 3.2

FUNCTIONAL RELATIONSHIPS OF ADMINISTRATIVE AND RELATED FUNCTIONS OF THE NORTH CAMPUS, SEATTLE COMMUNITY COLLEGE


Students
Sup-
porting
Services
Faculty
Adminis-
trators
Public

OUTWARD LOOK (Prime Responsibility)

Relates to the Public

1. Campus Vice President
2. Admissions Officer
3. Comptroller
4. Community Services Director
5. Plant Manager

INWARD LOOK (Prime Responsibility)

Relate to Students

1. Instructors — Advisors
2. Counselors
3. Instructional Resources Center Personnel
4. Bookstore and Student Center Personnel
5. Director of Student Services
6. Student Activities Personnel
7. Registrar
8. Financial Aids and Placement

Relate to Faculty

1. Curriculum Directors
2. Division Chairmen
3. Department Heads
4. Coordinators
5. Other Faculty
6. Coordinator of Data Processing
7. IRC Director and RAMP Supervisor

Figures 3.3 and 3.4 show the suggested relationships of administrative facilities to other campus functions and services.

FIGURE 3.3

FUNCTIONAL RELATIONSHIPS OF ADMINISTRATIVE FACILITIES FOR THE NORTH CAMPUS, SEATTLE COMMUNITY COLLEGE

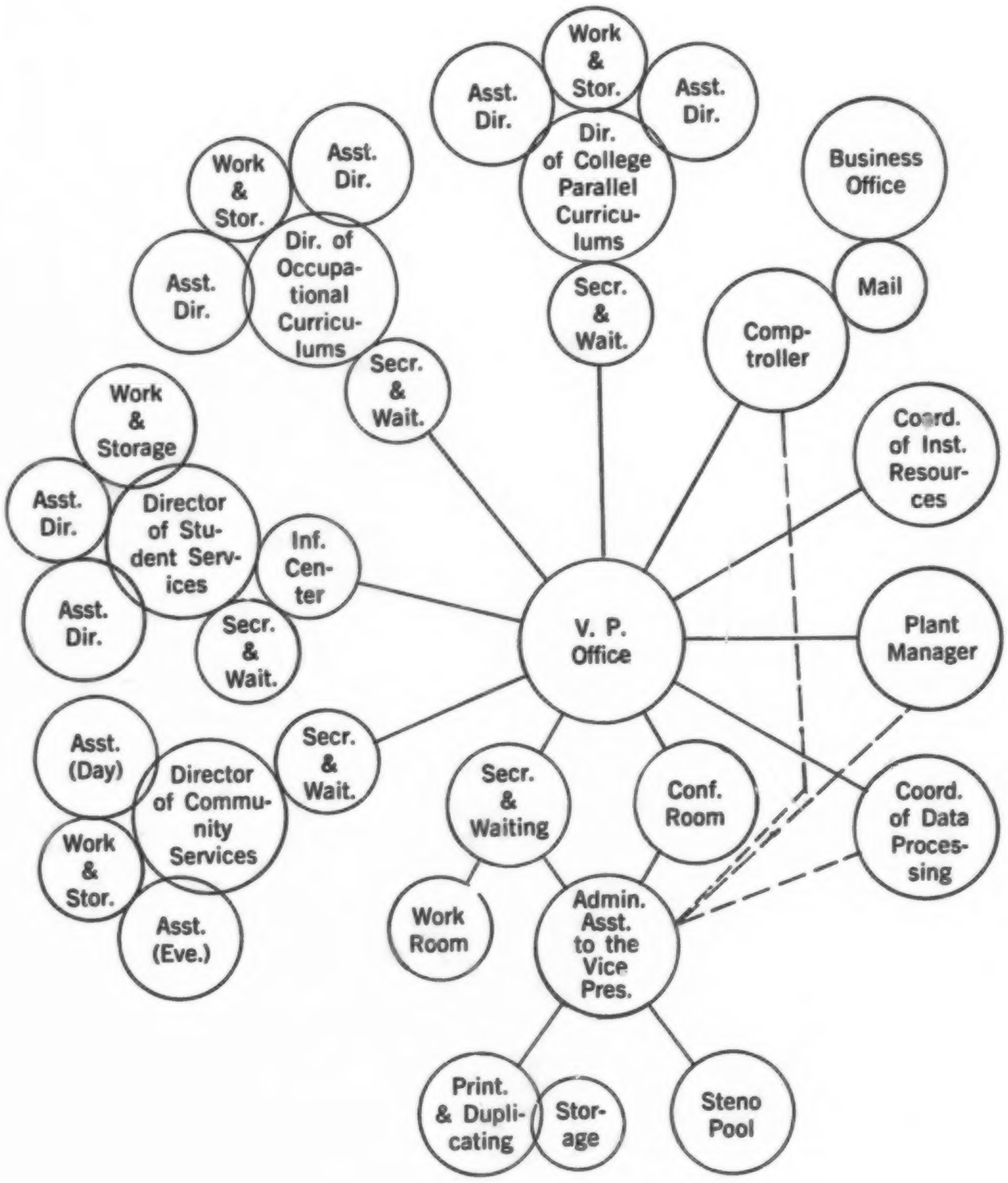
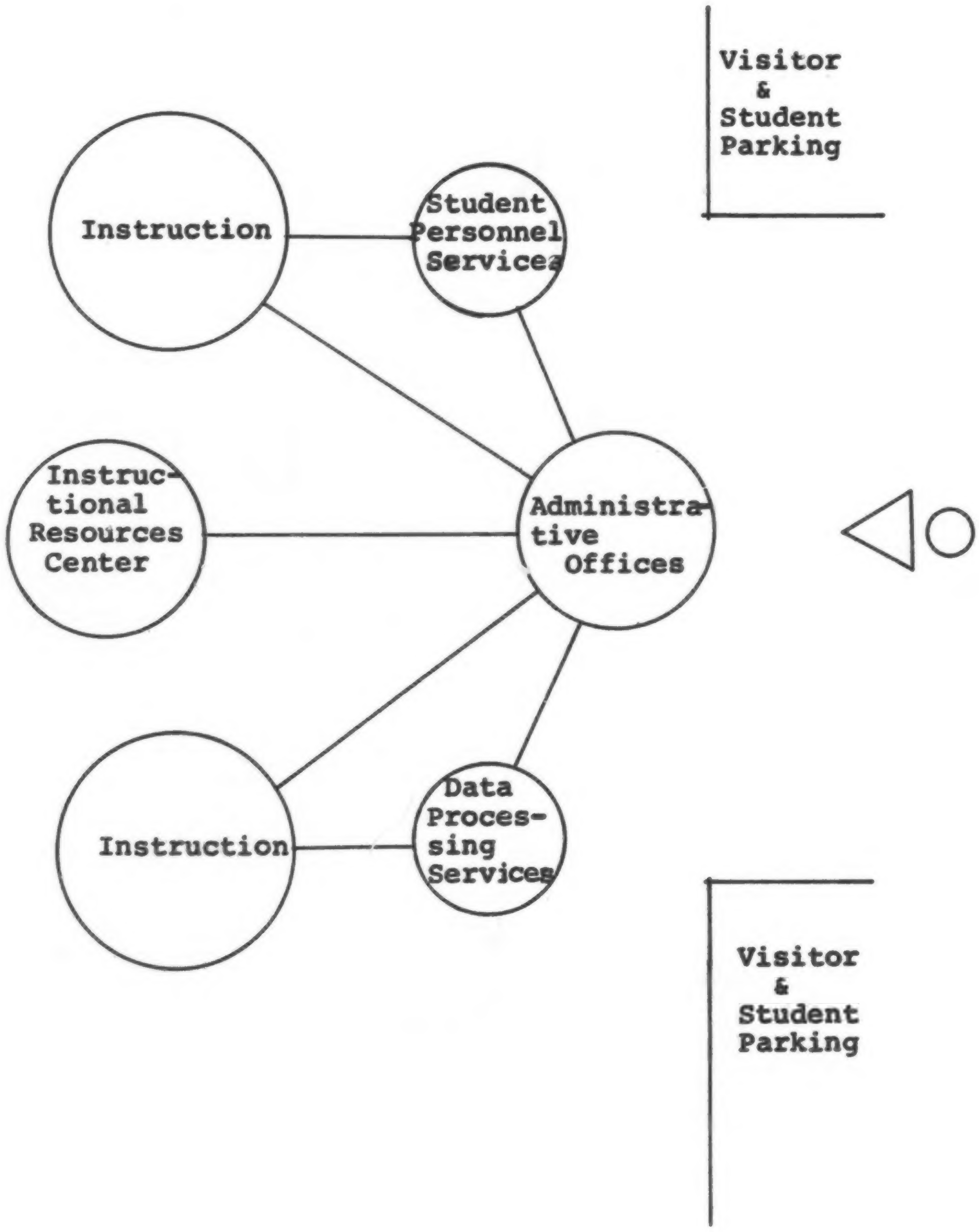

Asst. Dir.
Work & Stor.
Asst. Dir.
Dir. of College Parallel Curriculums
Business Office
Work & Stor.
Asst. Dir.
Asst. Dir.
Dir. of Occupational Curriculums
Secr. & Wait.
Mail
Comptroller
Secr. & Wait.
Work & Storage
Coord. of Inst. Resources
Asst. Dir.
Director of Student Services
Inf. Center
Asst. Dir.
Secr. & Wait.
V. P. Office
Plant Manager
Asst. (Day)
Director of Community Services
Secr. & Wait.
Secr. & Waiting
Conf. Room
Coord. of Data Processing
Work & Stor.
Asst. (Eve.)
Work Room
Admin. Asst. to the Vice Pres.
Print. & Duplicating
Storage
Steno Pool

FIGURE 3.4

OVERALL RELATIONSHIPS OF FACILITIES FOR ADMINISTRATION TO OTHER CAMPUS FUNCTIONS FOR THE NORTH CAMPUS OF SEATTLE COMMUNITY COLLEGE


Visitor & Student Parking
Instruction
Student Personnel Services
Instructional Resources Center
Administrative Offices
Instruction
Data Processing Services
Visitor & Student Parking

IV

FACILITIES FOR STUDENT PERSONNEL SERVICES

Philosophy and Objectives

The community college is based on the concept of service to the community and to its youth and adults. The college is dedicated to the purpose of stimulating each student to the greatest possible growth.

The Student Personnel Services program of the college consists of a series of related functions which support the instructional program; seek out and respond to student needs; and promote the personal, social, intellectual and career developments of the individual student. The well conceived and effectively implemented program of student personnel services will provide for the students:

1. Information services
2. Admissions services
3. Testing services
4. Guidance and counseling services
5. Registration services
6. Student health services
7. Leadership for student activities; i.e., self government, etc.
8. Special services such as food, recreation, bookstore, insurance, etc.
9. Placement services and scholarship, financial aid, follow up.

Essential Student Personnel Practices

1. Informing on-coming students about opportunities in the college.
2. Helping students make appropriate educational and vocational plans.
3. Helping students choose best levels in courses.
4. Registration of students.
5. Orientation of new students.
6. Helping students to perform at optimal level in courses.

7. Helping students resolve individual problems of housing, finances and health.
8. Helping students with personal problems.
9. Helping students select and transfer to next destination.
10. Testing and test interpretation.
11. Counseling.
12. Record keeping.
13. Institutional research on student characteristics.
14. Continuous evaluation of practices.
15. A student activity program.

Description of Functions and Services

Functions

The functions of the Student Personnel Services program are performed in a continuous interrelated systematic way for students from their first contact through the college program placement and follow up. Although there is a continuum of service, the total services logically fall into three classifications with the functions in each being more closely related in function, time and organization. These are (1) Information, Admission, Registration and Orientation; (2) Counselling and Testing; (3) Financial, Placement and Follow-up.

Relationships

External Relationships

The facilities for the student personnel service program are related most closely to those other parts of the college which must serve the public as well as the students of the college. Therefore, it should be directly related to the central administration and Business Office of the college. Since it also handles a lot of traffic of potential students, a location close to the front door of the college is essential.

Since there will be a number of people who drop in for information, completion of forms and similar activities, there should be available short term parking facilities. This also makes its connection with the administrative parts of the college desirable. The student personnel facilities should also be readily accessible to students on campus so it should be related to student traffic. Proximity to the college community center would be of value, although not necessarily attached or next door.

Internal Relationships

The functions are directly related but have been divided into clusters of immediate relationship. By having all of these services in physical proximity, interrelated use can be made of such things as student files without unnecessary duplication. These facilities can all be centered around one large entrance information area or they can be so designed as to be smaller clusters. The three clusters assist in the diversion of students to the area they desire without confusion. Student traffic can best be handled by having a sequential pattern which narrows the choices as one proceeds toward a specific area. Thus the campus needs a front door and dispersal center, and each subdivision in the building needs a focal point and dispersal center. There should be a way for a person to get to a specific office by himself without assistance, yet assistance should be available for the non-knowing at each dispersal point.

Emerging Trends

1. The concepts expressed regarding Student Personnel Services are emerging patterns and look to the future.
2. The data processing system will play an important role in the admission, registration and records system and should be fully utilized.
3. Facilities for peak periods of registration, orientation and similar activities requiring large spaces are not provided for, since it is assumed these are available on campus.
4. Phone use between these offices and outside, as well as between these offices and the rest of the campus, is very great. Phones should be provided in all offices, but should go through a central center at the information and reception station for each suite of offices.
5. Educational television and other types of media transmittal should be provided for in each information and reception area.
6. Programs of student personnel are in the development stage so spaces should be changeable, expandable and adaptable to new requirements.

Information, Admissions, Registration and Orientation

The major function of these services is to provide a flow of information and assistance to the individual student; taking him from his first contact with the college, through his registration for classes and continue with him throughout his membership in the college community.

The services should be organized to attract and serve the student, regardless of the method of contact. The services should be thought of as the "general services" and thus may result in a general offices concept or unit.

General Considerations

1. The services extend outward from the campus to the student and community as well as inward to the student on the campus.
2. The services can be considered as a part of the front door of the college through which prospective students pass on their way to becoming actual students.
3. It is desired that the services be accessible to the prospective student as well as to the registered student.
4. Careful consideration needs to be given to the various ways of communicating with students, both on the campus and off the campus.
5. All physical facilities should be easily identified, attractive, and inviting as well as efficiently organized for service.
6. It should be acknowledged that the services and their physical facilities have many similarities to the personnel services currently provided by business and industry.

Personnel

Directors and Assistants — 4

Secretaries and Clerks — 12

Part-time Clerks — 10

Facility Requirements

Reception and Information Area

This space should be designed to have a flow of traffic through the area. It needs to accommodate students getting information, filling out forms at counter and those waiting to be served. It is hoped that long waiting is not necessary and therefore, lounge-type furniture not necessary.

Counter Area

The counter area should be extensive so as to provide space for students to write on as well as an area underneath the counter to keep the active files of students. The counter also acts as a divider between the reception-information area and the work area.

Work Area behind Counter

This area houses the desks and work stations for the clerical staff of this area. The space should provide for work desks and room to wheel work carts alongside the desks. It is advantageous if the desks are placed perpendicular to the counter with adequate walking and counter work space between desk and counter.

Storage and Work Room

This should be located directly off the work space behind the counter. The total space can be a four-hour fire resistance area with a vault door large enough to wheel work carts through. The space should include storage units for file folders, transcripts, folders, etc. along the wall with a table and work area in the center. This area can be used by part-time workers and special task forces to do special jobs.

Office Suite for Directors

This area should have four private offices for directors and assistants large enough to hold furniture for meetings up to four or five people. They should be arranged around a central reception and secretarial space which serves all four offices. The reception and secretarial space should be large enough to provide for two secretaries and a waiting area for six persons. A good arrangement for the location of this office suite would be off of one end of the general office space so it could be gotten to from the large reception and information area, as well as available to the clerical staff who are in the space behind the counter.

Space Guidelines

Type		Approximate Sq. Ft.	
Reception Area	1	480	
Counter and Work Space for	1	600	
Storage Space Vault and Workroom	1	400	
Private Offices	4	480	(120)
Secretarial Offices (2 secretaries)	1	300	
Total		2,260	

Specific Requirements

1. The Reception and Information Area should have a supply of electrical outlets so lighted displays or automatic information devices can be used.
2. There should be an electrical plug-in strip the full length of the counter. One satisfactory way of doing this is to run the strip along the inside top of the counter so machines can be plugged in as desired.
3. The counter should contain space for files for student folders.
4. There should be electrical plugs and phone jacks at each of the desks in the work space behind the counter.
5. Adequate electrical outlets should also be in the storage room.
6. The offices of Directors and assistants should contain a conference-type desk and space for five or six persons.

Counseling and Testing

Counseling and testing services are an integral and essential part of the college program. These services are performed for students, faculty and community with the major involvement taking place on campus. The services and physical facilities should be developed to extend a welcome to both students and faculty members, and should not be thought of as something separate from the instructional program.

General Considerations

1. The facilities need to be easily accessible to the student and should present an atmosphere of automatic invitation.

2. These services may also be thought of as having communality and therefore should be arranged in a suite with a common reception area.
3. Services will be provided on a one-to-one and/or small group basis.
4. Facilities should provide for a feeling of openness when desirable, but also should provide for security when needed.
5. They should be in physical proximity to the records of the Admissions-Registrar function.

Personnel

Director of Counseling and Testing	1
Counselors	14
Secretaries and Clerks	4
Part-time Clerks	3-5

Facility Requirements

Reception and Information Area

This area should welcome the student and provide for a variety of services. There should be a discernable receptionist station for those who need information, but it should not prohibit persons from going directly to where they are going. The larger partition of this area should be more a lounge-type arrangement where students can wait, read information, view automated information and have informal discussions with a counselor.

Counter Area

This could be in conjunction with the receptionist information service and would divide the work area from the reception area. It should not be domineering nor very extensive but have a drawing power for those who are looking for it.

Work Area behind Counter

This area is similar to the area described in the previous facility but much smaller. It should accommodate four clerical stations and should provide easy access to the counter, to the lounge reception area and to counselors' offices.

Storage and Work Area

This area should be designed to provide space to store copies of tests, to collate materials, to score tests and for a general work area. It should be accessible and controllable from the work area behind the counter.

Counseling Offices

These offices should be private and provide a feeling of security when desirable. They should be pleasant and located preferably not in a line along a small double loaded corridor. They should be able to accommodate a desk, a chair, a file and at least two comfortable chairs so that the counselor-counselee relationship is not always conducted across a desk.

Office Suite for Director

This should be accessible directly from the reception area and preferably away from the major traffic of the area. The office of the director should accommodate regular office furniture and space for five or six other people. The secretary's office should provide space for regular furniture plus a waiting area for persons who want to see the director.

Group Testing and Conference Rooms

These spaces should provide for 25-30 persons taking a group test or five or more persons conferring together. The space is to be constructed so that the two smaller areas can be opened into one large area if the occasion requires it. These should have tables, chairs, chalk boards, bulletin boards and an availability of audio-visual equipment.

Individual Testing Rooms

These are rooms in which an individual student can take a test or complete forms or which, on occasion, can be used as small interview rooms. They should be able to be supervised visually from the work area as well as accessible to it. They should be made as pleasant as small rooms can be made.

Space Guidelines

		Approximate Sq. Ft.
Reception Area and Information	1	600
Counter and Work Area	1	400
Storage and Work Room	1	400
Counseling Offices	14	1,400
Director's Office	1	120
Secretary's Office	1	200
Group Testing and Conference Rooms	2	600
Individual Testing Rooms	5	400
Total		4,120

Specific Requirements

These are the same as those listed for the area for Information, Admissions, Registration and Orientation.

Financial Aids, Placement and Follow Up

These services may be a part of the counseling-testing suite or they may be in close proximity to it. Direct accessibility to students is important.

Personnel

Director and Assistant
Secretary

Facility Requirements

Reception, Information, Secretarial Area
Office for Director
Office for Assistant Director

This is primarily an area which has two offices off a reception-secretarial space. The offices need to be regular type offices which accommodate the directors and two or three persons in an interview situation. The reception area, however, needs to be large enough for displays, bulletin boards, listing boards and waiting area. Much of the activity of these services will center around this area rather than the offices.

This facility can be a part of some other cluster if it is easily accessible so traffic will not clog up other areas. There will be a lot of traffic in and out to read notices, pick up forms and other similar activities.

Space Guidelines

	Approximate Sq. Ft.		
Reception, Information, Secretarial	1	300	
Private Offices	2	200	(100)
Total		500	

Student Activities and Health Services

These services should be located in the college community center.

Summary

Table 4.1 summarizes the facilities needed for the Student Personnel Services Program.

Facility Relationships

Figure 4.1 is a diagram showing the flow of student personnel services and should assist in the assessment of relationships of personnel functions and students.

Figure 4.2 is a diagram of proposed functional relationships.

TABLE 4.1

SUMMARY OF SPACE CONSIDERATIONS FOR STUDENT PERSONNEL SERVICES AT NORTH CAMPUS

Type of Space	No. of Units	Approximate Net Space	
Information, Admissions			
Registration and Orientation			
Reception & Information Area	1	480	
Counter & Work Space	1	600	
Storage, Vault & Workroom	1	400	
Private Offices	4 (120)	480	
Secretarial Space	1	300	
			2,260
Counseling and Testing			
Reception & Information	1	600	
Counter & Work Area	1	400	
Storage and Workroom	1	400	
Counseling Offices	14 (100)	1,400	
Director's Office	1	120	
Secretary to Director	1	200	
Group Testing & Conference	2 (300)	600	
Individual Testing	5 (80)	400	
			4,120
Financial Aids and Placement			
Reception & Information	1	300	
Private Offices	2 (100)	200	
			500
Total			6,880

FIGURE 4.1

FLOW CHART FOR A STUDENT ENTERING, REGISTERING AND ATTENDING SEATTLE COMMUNITY COLLEGE

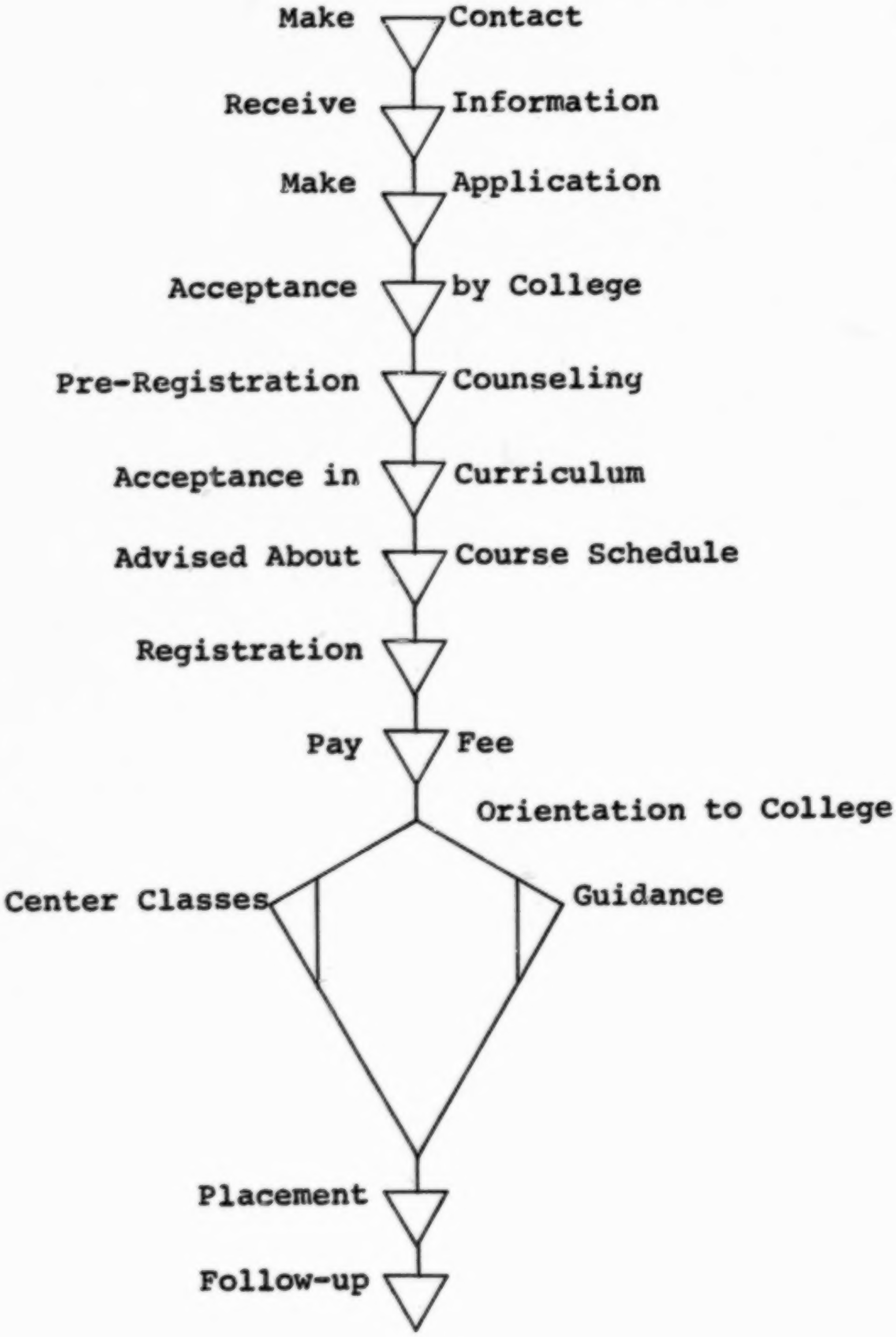
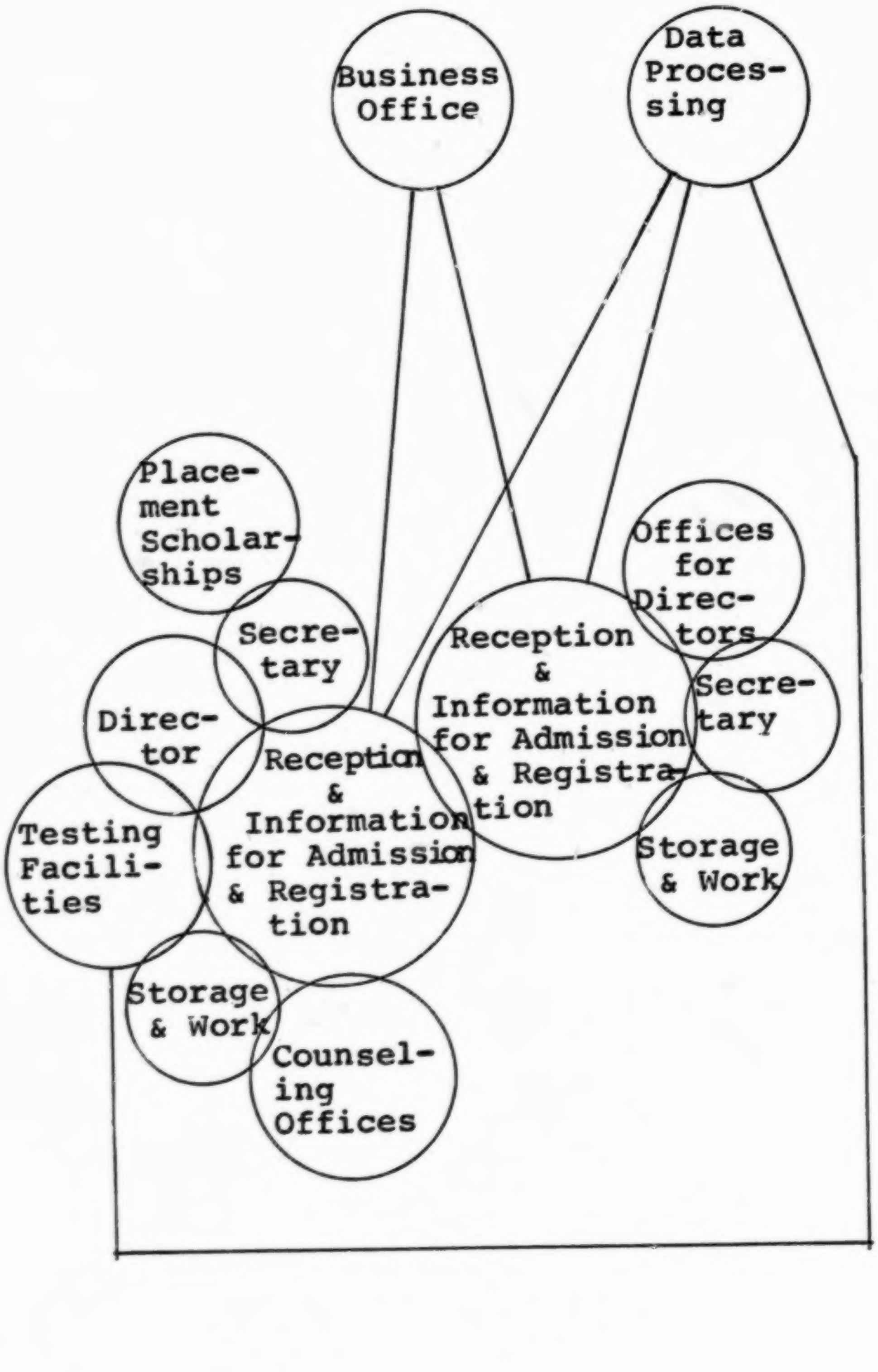

Make Contact
Receive Information
Make Application
Acceptance by College
Pre-Registration Counseling
Acceptance in Curriculum
Advised About Course Schedule
Registration
Pay Fee
Orientation to College
Center Classes
Guidance
Placement
Follow-up

FIGURE 4.2

RELATIONSHIPS OF STUDENT PERSONNEL SERVICES FUNCTIONS


Business Office
Data Processing
Placement Scholarships
Secretary
Director
Reception & Information for Admission & Registration
Testing Facilities
Storage & Work
Counseling Offices
Offices for Directors
Reception & Information for Admission & Registration
Secretary
Storage & Work

V

FACILITIES FOR THE COLLEGE COMMUNITY CENTER

Philosophy and Objectives

It is generally agreed that a college education includes and requires more than that which is included in the formalized instructional program. A commuting institution has the concern that students do not have a full-time commitment of their time for educational activities. This infers that students have choices to make as to how and where they spend their time outside the classroom. It may be spent at home, in the community or on the campus. The program and facilities of the college community center and Learning Resources Center will have much to do with attracting the students to spend time on the campus outside the classroom.

The Community College Center can contribute to the total educational program:

By facilitating the social interaction of students, faculty and staff on campus through both formal and informal activities that are social, cultural, intellectual and recreational.

By providing for individual needs of students, faculty and staff.

By stimulating the cultural and educational involvement of students.

By providing a temporary home away from home for the commuting student.

In order to do this the College Community Center:

Should provide a holding power for commuting students.

Should provide a variety of opportunities for individual to large group endeavors.

Should provide a central or unifying force to campus and educational program.

Should be centrally located so as to become the hub of student traffic.

Should be easily adaptable to a variety of uses.

Should make it possible to make activities educational as well as service oriented.

Description of Functions and Services

Functions

The functions of the College Community Center are related to the central objectives of the institution and are very important to the ongoing program of the students. The College Community Center is the campus home outside of the classroom for the students. The functions are:

To provide a variety of food services to students, faculty and staff.

To make available necessary instructional materials needed by the student in his program.

To provide for relaxation and personal involvement of students.

To provide a cultural atmosphere to inspire student awareness.

To provide facilities for student participation in the governing of student life on campus.

To provide emergency health services.

Relationships

External Relationships

The facilities of the Campus Community Center are related most closely to the Learning Resources Center and the hub of traffic on campus and student traffic coming onto the campus. The facilities need to be centrally located in order to be accessible and available to the greatest number. If located in a non-central location, its influence will be reduced. Its proximity to the Learning Resources Center makes available the two major out-of-class activity areas for use by students during a restricted time period. If a student has an hour between classes, he can spend a part of it getting a cup of coffee and the other part in the Resources Center.

Other than these, the relationships to other parts of the campus are the same.

Internal Relationships

The relationships of the various functions are primarily based on amount and kind of traffic desired or not desired to the specific function. Those facilities which have a lot of traffic should be off major traffic arteries of the building. It is also essential that the various services be so designed as to operate independently from the rest if this is the need.

Services of College Community Center

Food Services

Food services have the opportunity of providing a magnetic force for student involvement on campus. In order for this to happen, the food service facilities and program must be consonant with the needs of the students and faculty. The food service will have to be adaptable and malleable to the students rather than requiring that students adapt to it.

Food services vary from providing a cup of coffee or a coke to providing a snack, lunch, dinner, banquet or special catering for clubs and groups. Facilities must be designed to provide for the varied segments of the program at varied times.

Snack Bar

The center of and the most used facility of food services is the provision of snacks for the total time the campus is open. This facility should be accessible, convenient and able to be open without use of other facilities, yet have the possibility of over-flowing into other areas when needed. It should be attractive and designed and decorated around some motif.

An estimate of the number of students to be accommodated at one time should be 100 with possible overflow space for seating. An important consideration is that there be adequate traffic and waiting space between the counter and the seating area. The seating space should be comfortable and not crowded. The Snack Bar should be self-contained so it can be used without opening the total food service facility.

Cafeteria

The largest area in food services should be the cafeteria where lunches are served and which can be used by the students to sit and talk, study, drink coffee and soft drinks. It should seat 350 persons at a variety of sizes and types of tables. During the noon hour, it will likely serve 1,500 students with 500 in the evening. The atmosphere of the room is very important; it should not be a barracks or a large institutional dining hall. Carpeting for the floor is recommended, leaving some hard floor surface for dancing. It is desirable that the total floor area be broken into smaller units by use of planters and movable screens. Air conditioning is a necessity. The cafeteria should offer a friendly welcome to those who bring lunches and who buy only coffee or a soft drink or nothing at all.

Dining Rooms-Banquet Rooms

There should be four dining areas — one to accommodate 100, 2 medium size areas which accommodate 60 each and one small area for 30. These should be contiguous but separable with provisions to get to each without going through any of the others. All four should be adaptable so that with dividers removed, they would form a large banquet room to seat 250. All rooms should be carpeted and air conditioned.

Faculty Dining Room

One of the medium size dining areas could be used by the faculty.

Food Preparation Area

This must be designed to be able to service the total needs of the food service program. Specific information and details will have to be worked out with food preparation experts.

Vending Machines

Vending machines provide maximum contribution when they are used because of remoteness of the area or remoteness of the time of day. Their purpose is mainly to provide service when and if regular service cannot be made available.

Space Guidelines

Type	No.	Capacity	Approximate Square Feet
Snack Bar	1	100	1,500
Cafeteria	1	350	5,250
Dining Rooms			
Large	1	100+	1,500
Medium	2	60	1,800
Small	1	30	450
Food Preparation			(a)
Storage	1		(a)
Total			10,500

---

[a] This appears in Chapter XXI.

Large Lecture-Demonstration Area

The availability of a large lecture area seating about 350 in the student center would provide a much needed facility. It could be used as a teaching station, a demonstration center or a lecture hall.

Space Guidelines

Type		Capacity	Approximate Square Feet
Large Demonstration	1	350	(this appears elsewhere)

Student Activities

An important part of the center will be the facilities that provide for student participation in the activities of the college. The activities should assist the student to become a part of the campus community but should not dominate the student's time. A commuting college does not have to recreate a total community for the student, since he still resides in his home and participates in regular activities of his community. The college should provide activities related to the college and its objectives, primarily those which are not available in the community at large.

The major functions of activities are to provide live participation in things which the student desires as a part of his education, to extend the influence of the classroom, to develop students individually and as members of groups, and to provide for participation in the on-going development of the college and its program.

Facility Requirements

The facilities should be easily accessible to students but away from the regular internal traffic of the center. The internal relationships are not as important as accessibility and traffic patterns. Most facilities should be easily convertible to a variety of uses and adaptable if the pattern of demands change. The facilities are primarily spaces with a minimum of built-in equipment and furniture. Wherever possible, the ability to combine spaces will assist in meeting a wider variety of needs.

Staff for Student Activities

The activities and services provided for students will require staff people specially trained and responsible for the continuity of program.

Students come and go in a community college and have little opportunity to discover the development and maintenance of a program over the longer period. Good programs are dependent on a staff who have the ability to organize without dictating, to sponsor without supervising, to inspire and to give leadership. This can also become the student message center.

Personnel

Directors and Assistants	4
Secretary	1
Part-time Secretaries	2

Facilities Requirements

The facilities should be in a suite arrangement and should be located next to the area for student government. It is preferable if they have the same reception area for control, communications and working relationships. The suite should be so designed that the secretary can also be a receptionist.

Space Guidelines

Type	No.	Approximate Sq. Ft.
Offices (Director and Asst's.)	4 (120)	480
Secretary and Reception	1	300
Conference Room	1	250
Storage and Workroom	1	200
Total		1,230

Student Government

A center of activity for students will be the student government, since this becomes the vehicle for involvement, opinion and influence. The student government needs to have a home which is accessible to students yet has control by its location and relationship to the staff officers rather than by direct supervision.

Personnel	**No. of People**	**Spaces**	**Approximate Sq. Ft.**
Student Officers	6	6	600
Publications			
Editors	2	2	200
Staff Room	8	1	600
Workroom	8	1	600
Conference Rooms (dividable)	30	2	600
Total			2,600

Facility Requirements

The student officers need an office suite to accommodate the four student officers and the Presidents of Associated Men and Women Students. These are regular-type offices which will accommodate a desk and at least two chairs.

The publications area should be a large area to accommodate at least eight people at desks as well as a work area for mock-ups. Attached to the area should be two offices for the editors of the paper and yearbook.

The workroom should be a large room with storage on the walls with work counters and a large work table. This room would be used for making signs and other equipment needed by students in their activities.

The conference rooms should be devised so as to be able to hold fifteen or twenty, yet dividable for smaller groups. There will be much demand for these rooms by the various clubs and activity groups as well as the student council.

Student Health Services Area

This facility should provide health services to students including screening, examination, counseling, first aid and those services supplemental to the health education program of the college. This facility should be located so the receptionist in the Student Activities area can serve as receptionist for health services also.

Personnel

Head Nurse	1
Part-time Doctor or Nurse	2

Facility Requirements

The facilities should be in suite arrangement accessible to the reception area for student activities. Toilet facilities should be provided.

Space Guidelines

		Approximate Sq. Ft.
Reception and Receiving Area	1	120
Office for Head Nurse	1	80
Examination Room	1	200
Rest Areas for Men	2	100
Rest Areas for Women	6	300
Total		800

Social Activities

While most of the social activities will use spaces which are used for other purposes, there need to be provided a variety of lounge areas ranging from the quiet meditation to more communal activities such as TV viewing. Spaces should be pleasant, comfortable, iniviting but not large. They should adapt easily to multi-use such as meetings, small dances, etc. They should be spaces which preferably can be combined to become larger spaces. Special activities such as TV should have a separate lounge area so as not to interfere with less noisy activities.

Facility Requirements

Main Lounge

There needs to be a large lounge area which has lounge furniture arranged in conversation groups for persons waiting. This area can also be used for other activities such as a dance, a large meeting, a tea, etc. by re-arranging the furniture.

Small Lounges

The areas are small and more intimate for quiet meditation or piped classical music. They could be divided so as to be able to be combined if necessary, although the sound requirements may prohibit this.

Viewing Lounge

A separate space for TV viewing is essential if it is not to take over the other areas. For special events the larger lounge may be used, but for day to day operation the separate space is necessary.

Study Lounge

This should be adjacent to the food service area so it is accessible to coffee and cold drinks. This could be equipped with tables and chairs rather than lounge-type furniture.

Space Guidelines

Type	No. of People	Spaces	Approximate Sq. Ft.
Smaller Lounges	30	2	900
Viewing Lounge	30	1	450
Study Lounge	100	1	1,500
Total			2,850

Recreational Activities

There is much disagreement about the need for and the extent of the spaces provided for recreational purposes. There is also the relationship of the Physical Education Program and the rise of those facilities. It is recognized that individuals and small groups need the opportunity for recreational activities other than scheduled classes. It, therefore, seems wise to provide an area for activities which require little organization and supervision. Thus an area for noisy activities such as table tennis and an area for quieter activities such as chess are desirable. Again these are areas without special equipment, just space.

Space Guidelines

Type	No. of People	Spaces	Approximate Sq. Ft.
Active Recreation	40	1	2,500
General Games	50	1	800
Total			3,300

Student Services

One area of the center should provide for a variety of services required by students in carrying on their educational program. The services should be a part of the program rather than competitive with the community or because they are potential money-makers. This area should be accessible so students pass by it, but it should not be a dominating feature of the Center upon first arrival. The most often found service is the Bookstore, which may encompass the other services. The major concern of the Bookstore is to provide those items related to the needs resulting from the college program.

The facilities and space guidelines indicated here are for this type of program, and if the role should be different the space will be inadequate. There should also be adjoining space which can be used as a place to sell books during the first few days of the quarter and then revert to another use. The best such space would be the study lounge.

Other possibilities for service which can be included in the bookstore are post office, candy and snacks. A space for a barber shop is becoming more frequent on commuting campuses.

Space Guidelines

Type	No. of People	Spaces	Approximate Sq. Ft.
Store			
Retail Sales		1	6,000
Receiving and Storage		1	1,500
Offices		2	240
Retail Outlet		1	400
Total			8,140

Formal Lounge

Every campus needs a formal lounge which is not open to the general public, but is used for special occasions which require privacy and special treatment. This space may be for receiving honored guests, small receptions and teas, and other such events. It should have a small pantry off it for serving.

Space Guidelines

Type	No. of People	Spaces	Approximate Sq. Ft.
Formal Lounge	100	1	1,500*

*Cross reference with IRC

Gallery

The center should provide adequate space for displaying exhibits of all kinds. This can be arranged as a part of a large entrance foyer with an area adjacent to or convertible from the open gallery for special exhibits such as a valuable art show.

Space Guidelines

Type	No. of People	Spaces	Approximate Sq. Ft.
Gallery		2	1,800

Cloak Rooms

It is agreed that large areas of locker space are neither desirable or usable on a commuting campus. However, a space which can be used as a coat or check room for regular students and for separate events is needed. This space can be made controllable by a check girl. It should be accessible to the main entrance of the building.

Space Guidelines

Type	No. of People	Spaces	Approximate Sq. Ft.
Cloak Room	1,000	1	600

Rest Rooms

The center requires rest rooms which are accessible for use by people using the various facilities. They, therefore, need to be considered carefully, but are not included in space allocation.

Space Summary

Table 5.1 contains a summary of the number and type of facilities required for the College Community Center.

Space Relationships

Figure 5.1 is a diagram of functional relationships for the College Community Center Services.

TABLE 5.1

SUMMARY OF SPACE CONSIDERATIONS FOR COLLEGE COMMUNITY CENTER NORTH CAMPUS

Type of Space	No. People	No. Spaces	Approximate Square Feet	TOTAL
Food Services				
Snack Bar	100	1	1,500	
Cafeteria	350	1	5,250	
Dining Rooms				
Large	100	1	1,500	
Medium	60	2	1,800	
Small	30	1	450	
Food Preparation			(a)	
Storage			(a)	
				10,500
Large Lecture-Demonstration	250	1		
Student Activities				
Student Activities Staff				
Offices (Director & Ass'ts.)	4	4	480	
Secretary & Reception	3[b]	1	300	
Conference Room	20	1	250	
Storage & Workroom		1	200	
				1,230
Student Government				
Student Officers	6	6	600	
Publications				
Editors	2	2	200	
Staff Room	8	1	600	
Work Room	8	1	600	
Conference Rooms	30	2	600	
				2,600

TABLE 5.1 (Cont'd)

SUMMARY OF
SPACE CONSIDERATIONS FOR COLLEGE COMMUNITY CENTER
NORTH CAMPUS

Type of Space	No. People	No. Spaces	Approximate Square Feet	TOTAL
Student Health Services			800	800
Social Activities				
Small Lounges	30	2	900	
Viewing Lounge	30	1	450	
Study Lounge	100	1	1,500	
				2,850
Recreational Activities				
Active Recreation	40	1	2,500	
General Games	50	1	800	
				3,300
Student Services				
Bookstore				
Sales		1	6,000	
Receiving and Storage		1	1,500	
Office (Manager's)		1	240	
Retail Outlet and Storage		1	400	
				8,140
Formal Lounge	100	1	1,500	1,500
Gallery		2	1,800	1,800
Cloak Room	1,000	1	600	600
Total				33,320

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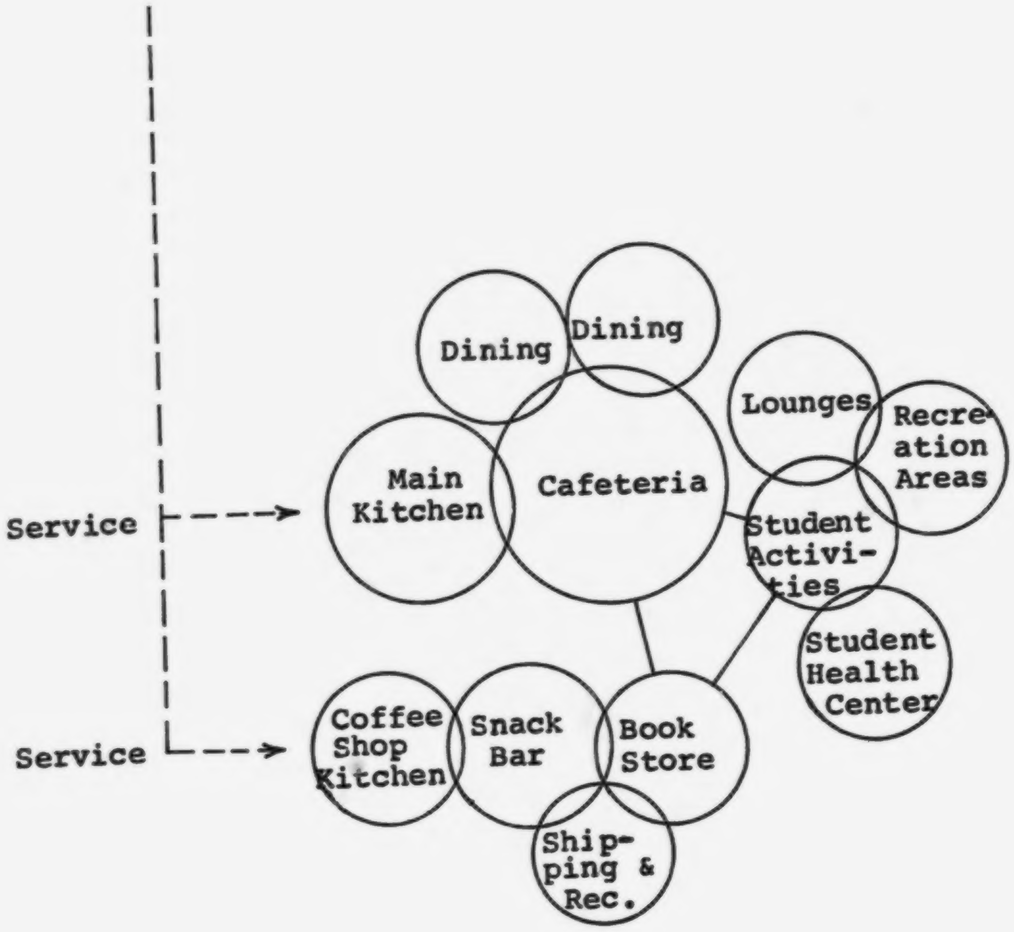
[a] See Chapter XXI, Food Services.
[b] Includes two part-time.

FIGURE 5.1

DIAGRAM OF FUNCTIONAL RELATIONSHIPS OF THE INTERNAL COMPONENTS OF THE COLLEGE COMMUNITY CENTER


Dining
Dining
Lounges
Recreation Areas
Main Kitchen
Cafeteria
Service
Student Activities
Student Health Center
Coffee Shop Kitchen
Snack Bar
Book Store
Service
Shipping & Rec.

VI

FACILITIES FOR THE INSTRUCTIONAL RESOURCES CENTER

Philosophy and Objectives

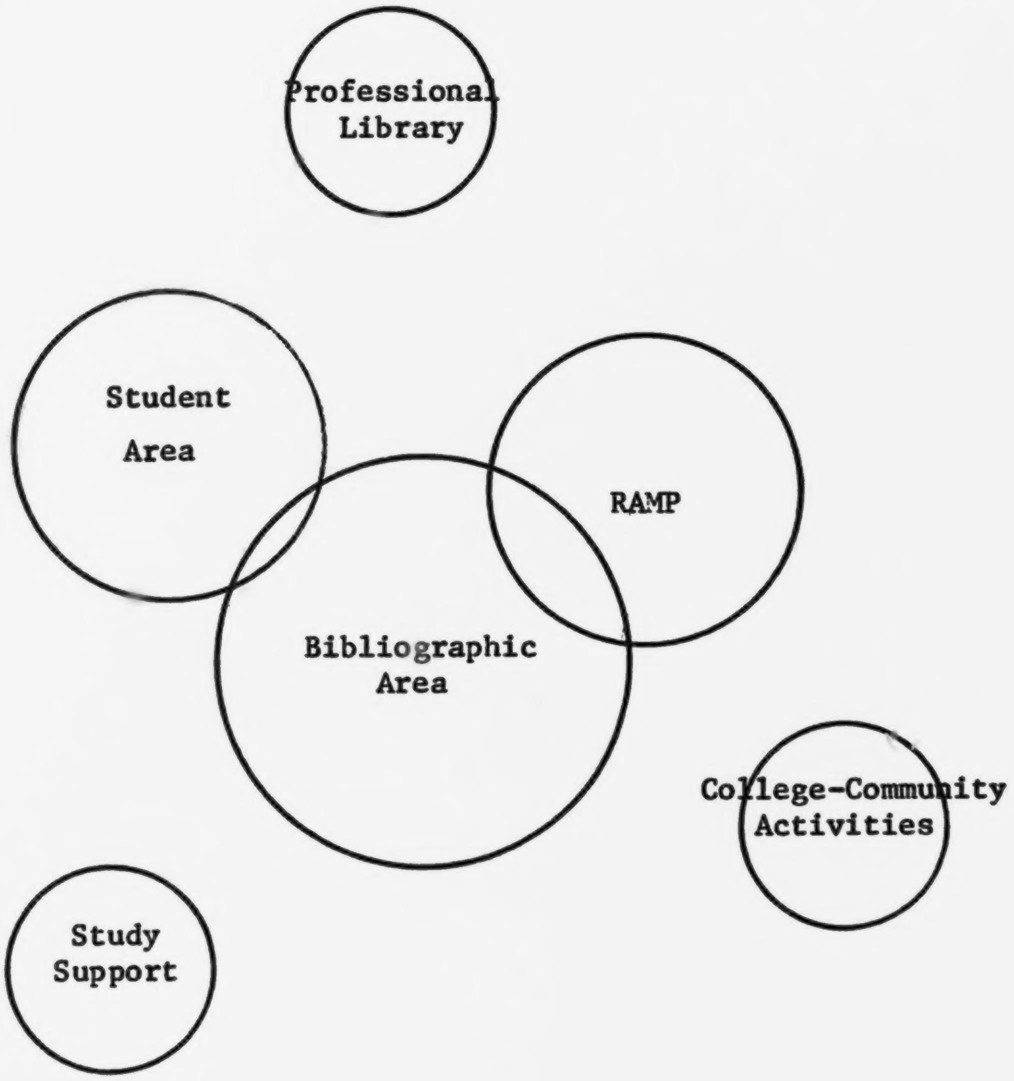
The Instructional Resources Center is the most important instructional unit on the campus. It is a facility which serves students and faculty alike. Not only does it support the activities of the classroom, but it also provides a place for creative learning activities which are not necessarily parts of formal classroom instruction. It brings unity to all phases of instruction. It lends essential support to the instructional staff. It provides both students and faculty with opportunities to carry out individual research and independent study. Thus, the Instructional Resources Center has an impact upon the entire college.

The Instructional Resources Center has three major objectives and three important minor objectives. These objectives are implied by the components of this facility indicated in Figue 6.1. This figure shows the elements which constitute the Instructional Resources Center. These elements constitute the conceptual framework upon which the design of this facility must be based. In the figure, the "Bibliographic Area" refers to those spaces devoted to stacks, circulation, reserve and general administration. It is intended that there be housed and circulated here a carefully selected list of appropriate titles in the form of books, periodicals, documents, tapes, disks, microforms, films, photographs, maps and the like. The term "Student Area" refers to reading and study spaces, facilities for the use of programmed materials, general reading rooms, special areas for the use of special IRC materials and electronic carrels. The term "RAMP" refers to spaces devoted to Resources for the Audio-visual Mode of Presentation, a system which will be described later in this chapter.

While the three areas named will constitute the primary spaces in the facility, the implementation of several other objectives of the college will be assisted by the use of certain secondary spaces to be included. One of these secondary spaces is the "Professional Library." Here will be housed a collection of journals, references, documents, texts and books of special interest to faculty members in a comprehensive community college. Here, too, the in-service education of faculty members can be accom-

FIGURE 6.1

CONCEPTUAL FRAMEWORK FOR THE INSTRUCTIONAL RESOURCES CENTER


Professional Library
Student Area
RAMP
Bibliographic Area
College-Community Activities
Study Support

plished. And here faculty members can assemble for private study, conversation and interaction. A second cluster of secondary spaces within the Instructional Resources Center should include tape recorders, typewriters, photocopy machines, adding machines and calculators, and other aids for students to use in support of their study functions. A third cluster of such spaces is associated with the college and its internal and external communities. Spaces to house those special services which the college can provide in an urban community and spaces to provide for the intellectual confrontation of students, faculty, institutional officers and campus visitors are considered to be included in this last category.

Functions and Services to be Housed

Among the functions which the Instructional Resources Center performs and the services it provides are the following:

1. Cataloging materials.
2. Shelving and storing materials.
3. Retrieving materials.
4. Reviewing and selecting materials.
5. Maintaining certain materials on reserve.
6. Accounting for materials and making them available.
7. Reproducing certain kinds of materials.
8. Making materials available in new formats.
9. Technical processing of materials.
10. Inter-Library loan services.
11. Maintaining relationships with other institutions.
12. Maintaining information services on IRC holdings and techniques.
13. Providing in-service training for IRC personnel and SCC faculty.
14. Assisting faculty members with materials related to their study, preparation and instruction.
15. Orienting students to the use of the IRC.
16. Providing facilities to support the study function.
17. Assisting students in the location and use of IRC materials.

18. Providing all services associated wiht RAMP (these will be described in detail later in this chapter.)
19. Providing special services for the urban community in which the college is located.
20. Maintaining special collections, including archives, which relate to the college and its programs.
21. Cooperating with an IRC Coordinator on the central administrative staff to expedite IRC management and to avoid the duplication of rarely used holdings on all three campuses.

Some of the services mentioned in the list above are purely managerial or administrative in nature; others have important implications for the facilities in which the IRC is housed.

Among the activities which will take place within this facility are the following:

1. Individual study.
2. Small group study.
3. Occasional large group study.
4. Use of standard reference works.
5. Search for relevant materials through use of conventional and automated indexing aids.
6. Listening to audio tapes or disks.
7. Watching video tapes of films.
8. Small and large group discussions.
9. Personnel and materials administration, including functions related to branch libraries.
10. Production processes related to RAMP (a discussion will follow later in this chapter.)
11. Formal and informal instruction of students and faculty.
12. Receiving and dispatching IRC materials.
13. Use of optical readers, photocopy machines, typewriters, calculators and other devices which support instruction.
14. Check-out, check-in, shelving and inventory of materials.

15. Motivating students and faculty members to take advantage of the resources available in this center.

All of the activities in the list above have implications for the nature of the facilities for the IRC.

RAMP: The Resources for the Audio-Visual Mode of Presentation[1]

RAMP

An important part of the total instructional program of any institution of higher education is carried out by means of audio-visual materials. Likewise, an important fraction of the equipment maintained on a college's inventory consists of the paraphernalia and devices by which such audio-visual materials are presented or displayed.

That audio-visual materials assist in instructing and contribute to learning is axiomatic and requires no comment. On the other hand, it is worthwhile to note the following:

1. Audio-visual materials are effectively used only when all conditions related to their use contribute optimally.

2. Certain new materials, techniques and devices in the general audio-visual area have recently been developed.

Both of the comments just listed have important implications for college teaching. Community colleges especially—because of their expressed dedication to excellence in instruction—will be vitally concerned both with maximizing the factors contributing to effective use of these materials and with new developments in the field.

This document is a proposal for a system wherewith Seattle Community College can advantageously organize and utilize all available audio-visual materials. The code name RAMP has been coined to designate this system, RAMP being an acronym for "Resources for the Audio-visual Mode of Presentation." Included here are descriptions of the components and facilities needed to implement the proposed system; suggestions for its organization, operation, and utilization; and estimates of the staff and services which it will require.

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[1] This discussion of RAMP is a verbatim quotation from a paper prepared by Associated Consultants in Education for the General Planning Concepts Committee, Seattle Community College (July, 1966). (Processed.)

The RAMP System

RAMP consists of all the activities related to (1) the procurement, production, processing, inventory, storage and distribution of audio-visual materials and supplies and (2) the procurement, inventory, storage, maintenance, repair, distribution and operation of all devices and equipment related to the display of audio-visual materials. (Important exclusions from the materials and equipment implied by this statement are those which traditionally are associated with a single specialized discipline and which conventionally constitute laboratory apparatus for such a discipline. Examples are microscope slides.) RAMP, thus, is concerned with all aspects of the use of such materials and equipment. It is, in fact, to be concerned even with the in-service training of teachers in the audio-visual area. Although the institution's total in-service teacher training program will encompass considerably more than just audio-visuals, these aspects are major ones, so that RAMP will contribute significantly to the teacher training effort in the institution. RAMP also will have supervisory and administrative responsibility for broadcast and closed-circuit TV on campus. RAMP will originate materials from faculty specifications. It will procure them on faculty request. It will assist faculty members to manufacture materials. It will include administrative machinery to enable it to act as an advisory and coordinating body for all matters in its domain. Figure 6.2 indicates diagrammatically these relationships.

RAMP is a division of the Instructional Resources Center. Its personnel will report through a RAMP Director to the IRC Director and thence to the chief executive officer of the campus. RAMP services will be equally available to all instructional units of the college. Funding for its operation should be available through the main IRC budget, with appropriate charge-backs to the operating budgets of the various instructional units of the college. While the charge-back system inaugurated must realistically reflect usage of RAMP services by the various instructional units, it must *not* be restrictive and delimiting in its nature. Adequate allowance for the use of RAMP must be made in the operational budgets of both the IRC and the other units of the college.

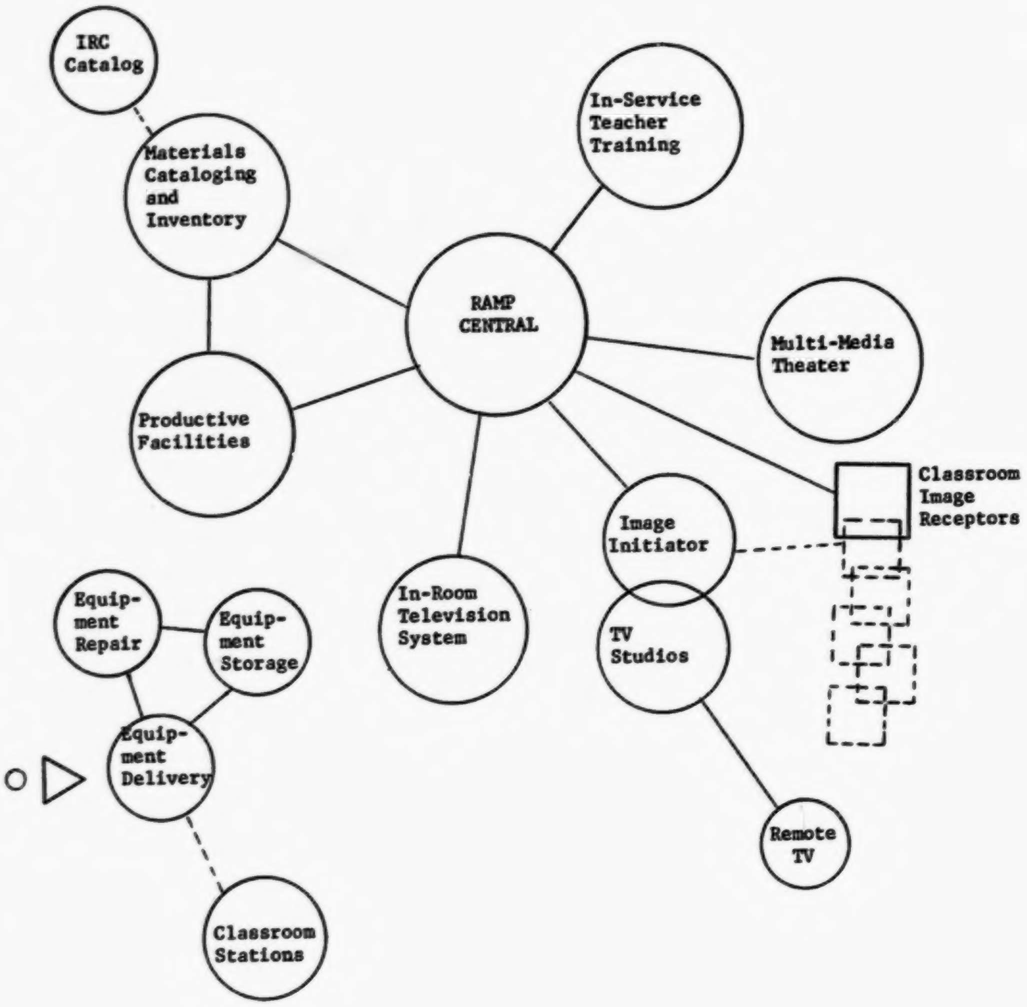
RAMP Materials and Equipment

The materials with which the RAMP System is concerned include the following:

1. 16 mm films (reel or cartridge)
2. 8 mm films (reel or cartridge)

FIGURE 6.2

FUNCTIONS AND RELATIONSHIPS WITHIN THE RAMP SYSTEM


IRC Catalog
Materials Cataloging and Inventory
In-Service Teacher Training
RAMP CENTRAL
Multi-Media Theater
Productive Facilities
Classroom Image Receptors
Image Initiator
Equip-ment Repair
Equip-ment Storage
In-Room Television System
TV Studios
Equip-ment Delivery
Remote TV
Classroom Stations

3. Filmstrips
4. Glass slides
5. 2″ x 2″ slides (single or magazine)
6. Audio disks
7. Audio tapes
8. Video tapes
9. Photographs
10. Posters
11. Charts
12. Transparencies and overlays for the Overhead Projector
13. Maps
14. Globes
15. Three-dimensional models
16. Broadcast transmissions
17. Closed-circuit transmissions
18. Appropriate supplies for the manufacture, duplication, maintenance and repair of any of the above
19. Others which may appear as developments in the audio-visual field

The equipment with which the RAMP system is concerned includes the following:

1. 16 mm projectors
2. 8 mm projectors
3. Film-loop projectors
4. Opaque projectors
5. Overhead projectors
6. Turntables and associated equipment for recording play-backs
7. Audio tape equipment, for recording and play-back
8. Television studios

9. In-room television circuits
10. Television view screens
11. Broadcast receivers
12. Screens
13. Display stands for graphics, posters, etc.
14. Equipment and apparatus for producing all types of RAMP materials
15. Equipment for delivery of RAMP materials and apparatus
16. Equipment for the maintenance and repair of RAMP materials and apparatus
17. Equipment for storage and inventory of RAMP materials and apparatus
18. Other equipment which may become necessary as developments in the audio-visual field occur

The Electronic Heart of RAMP

Many of the RAMP materials can be made available to the classrooms on campus by electronic transmission from a central location. Television view screens in classrooms, connected by cable to image initiation equipment in the IRC, can be employed for the majority of the displays of slides, 16 mm films, photographs, film-loops and the like. To this end, image initiation equipment and receptor view-screens should have color capability. Furthermore, telephone (or intercom) connections must be made from each reception station to the image initiation center. And finally, because of anticipated high usage demand on the image initiation equipment, it must have the capability of transmitting different information on each of six different channels simultaneously; receptor stations, similarly, must be able to select from the six channels of available transmission. The capability for expansion to 12 channels should be built into the system.

Image initiation can be accomplished either from a schedule submitted in advance or on demand by telecommunication from the classroom.

The image initiator must have the capability for transmission of "live" programs from studios or remote locations, 8 mm or 16 mm films, slides and transparencies and opaque graphics including photographs; it should be usable in video-only, audio-only or audio-visual modes. The image initiator station should be an integral part of the television studios and must be located in the IRC. Image receptors should be located in approximately 50 per cent of the classrooms on campus, with built-in capability for extension of receptor services to all classrooms.

The Non-Electronic System

Non-electronic devices will continue to support the RAMP system. For example, every classroom should be permanently equipped with an overhead projector. Every classroom should have a screen mount and/or screen. Every classroom should have adequate electrical service for use of RAMP equipment. The RAMP central office must be equipped and staffed to deliver, operate and repair slide projectors, filmstrip projectors, movie projectors and the like. In addition, RAMP should maintian several portable video-tape recording units for in-room use in instruction and several in-room closed circuit TV systems for magnifying details of classroom demonstrations. RAMP should supervise one "multi-media" lecture theatre for use by schedule and reservation.

The Manufacturing System

RAMP must have a production department with capabilities for the following:

1. Producing transparencies from paper copy, photographs or books
2. Copy-camera work, B & W and Color
3. Still photography, B & W and Color
4. Photo-offset printing, B & W only
5. Movie photography, B & W, Color
6. Micro photography
7. Drafting, lettering, technical illustration and other graphic arts
8. Model Production (wood, paper, metal, plastic)
9. Audio recording
10. Video recording
11. Encapsulating film loops
12. Photographic processing
13. Slide binding

14. Others which may develop

The Personnel of RAMP

To implement the RAMP system, the following functions are required:

1	Ramp Director
1	Photographer
1	Artist/Draftsman
1	RAMP Librarian/Secretary
1	Equipment Repairman
1	TV Director
2	TV Studio/Control Room Assistants
6	Student Assistants (part-time) for delivery, operation, etc.

The Core Facilities of RAMP

Figure 6.3 presents a tentative concept of the spaces required in the IRC and elsewhere to implement the RAMP system. Figure 6.4 presents a tentative concept of a classroom which fully utilizes RAMP techniques. Figure 6.5 presents some details of the Image Initiation facilities for RAMP and Figure 6.6 presents a concept for a "multi-media" lecture theater, a special facility under RAMP auspices. Thus, Figure 6.3 through 6.6 outline the facilities utilized and required by the RAMP system.

Estimates of Quantities

Table 6.1 is a list of estimated quantities for equipment to be incorporated into the RAMP system; these estimates are based in part on recommended ALA standards but have been somewhat drastically revised to fit the special requirements and capabilities of RAMP as projected.

FIGURE 6.3

SPACES SUGGESTED TO IMPLEMENT THE RAMP SYSTEM

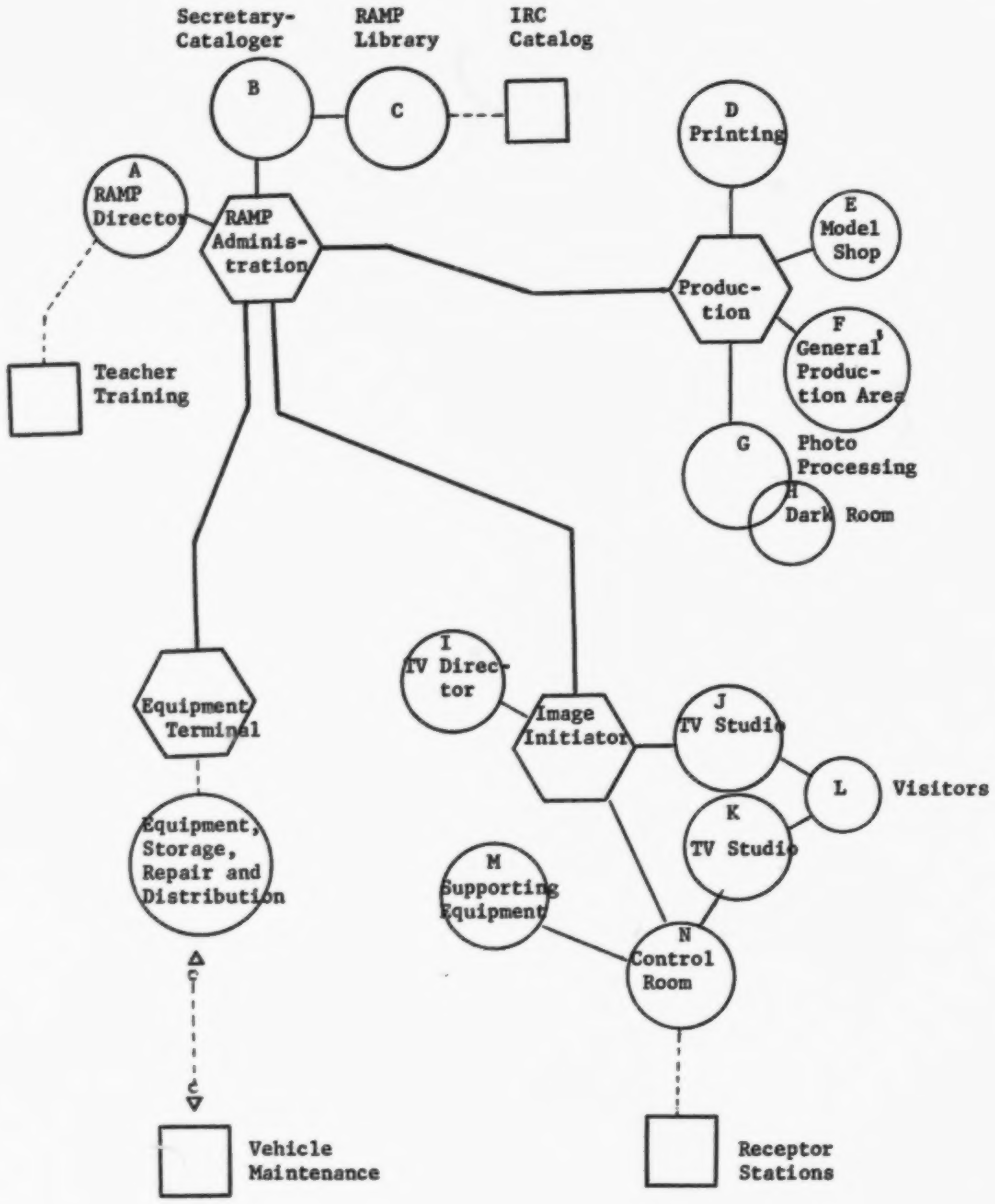
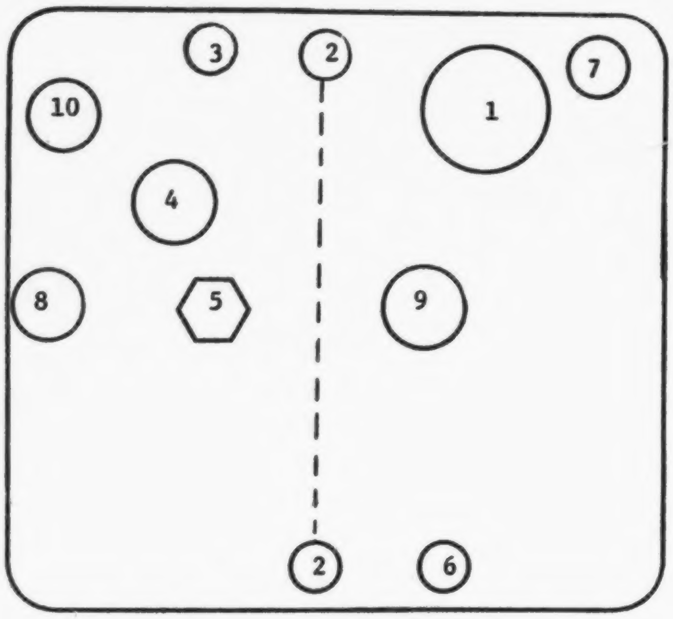

Secretary-
Cataloger
RAMP
Library
IRC
Catalog
B
C
D
Printing
A
RAMP
Director
RAMP
Adminis-
tration
E
Model
Shop
Produc-
tion
F
General
Produc-
tion Area
Teacher
Training
G
Photo
Processing
H
Dark Room
I
TV Direc-
tor
Equipment
Terminal
Image
Initiator
J
TV Studio
L
Visitors
K
TV Studio
Equipment,
Storage,
Repair and
Distribution
M
Supporting
Equipment
N
Control
Room
Vehicle
Maintenance
Receptor
Stations

FIGURE 64

COMPONENTS OF A CLASSROOM AREA WHEREIN RAMP SERVICES ARE UTILIZED



1. Receptor Viewscreen and Speaker (Remains permanently)
2. Speaker--Projector Jack (wired-in as a facility is constructed)
3. Screen (remains permanently)
4. Overhead Projector (remains permanently)
5. Brackets for holding TV Camera or service for portable closed-circuit TV System
6. Projector Stand (available electric service)
7. Telephone to Image Initiator Control Station
8. Black-out capability (built in during facility construction)
9. Electric Service for equipment
10. Easel (tripod, map rail, etc.) for display of graphics

FIGURE 6.5

COMPONENTS OF AN IMAGE INITIATOR TERMINAL FOR ELECTRONIC DISTRIBUTION OF RAMP SERVICES

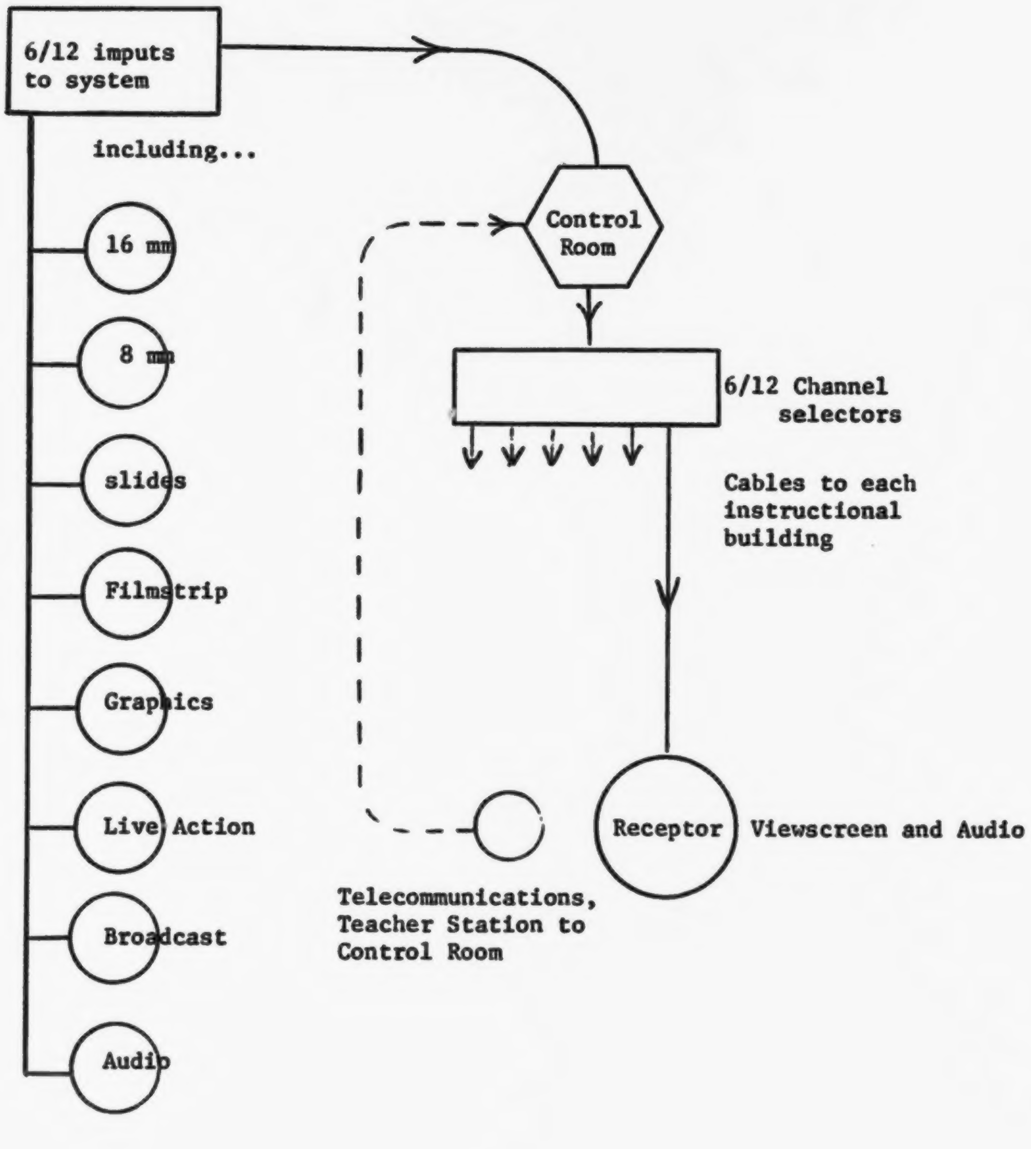
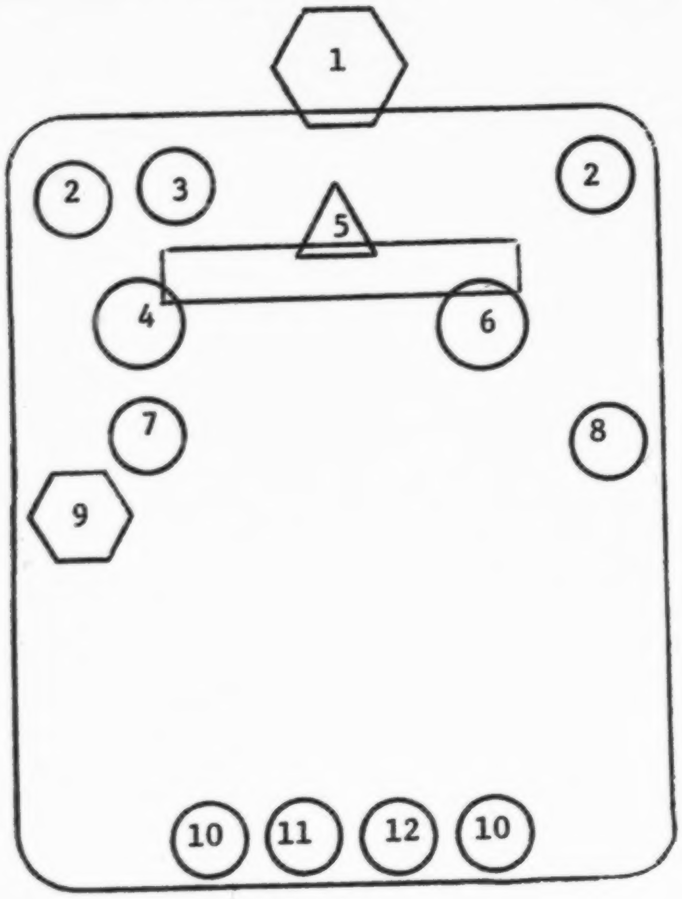

6/12 imputs to system
including...
16 mm
8 mm
slides
Filmstrip
Graphics
Live Action
Broadcast
Audio
Control Room
6/12 Channel selectors
Cables to each instructional building
Receptor
Viewscreen and Audio
Telecommunications, Teacher Station to Control Room

FIGURE 6.6

COMPONENTS OF A LECTURE THEATER USING MULTI-MEDIA RAMP TECHNIQUES



1. Rear Projection Screen for TV
2. Optical Screen
3. Screen for Overhead Projector
4. Overhead Projector
5. Instructor's Control Terminal
6. TV Camera, Ceiling Mounted

7 & 8. TV Camera

9. TV Operator
10. Slide Projector
11. Filmstrip Projector
12. Movie Projector

TABLE 6.1

ESTIMATED RAMP MATERIALS AND EQUIPMENT NEEDS FOR INSTRUCTIONAL RESOURCES CENTER, SEATTLE COMMUNITY COLLEGE

Quantity	Item	Remarks
1,000	16 mm Films, college titles	Plus rentals
2,500	Filmstrips, college titles	Duplicate as needed
2,000	Audio Disks and/or tapes	Duplicate as needed
——	Single concept Films	As available and as manufactured by RAMP
——	Transparencies	As available and as manufactured by RAMP
1	35 mm Sound Projector	Auditorium
25	16 mm Sound Projectors	
10	8 mm Sound Projectors	To be increased 25
25	Film loop Projectors	
25	2″ x 2″ Slide Projector	
25	Filmstrip Projector	
10	Filmstrip with Sound Projectors	
5	3-¼″ x 4″ Slide Projectors	
120	Overhead Projectors	1 per classroom; 1 in certain labs; multiples in some classrooms
5	Auditorium type Overhead Projectors	1 per lecture theater
5	Opaque Projectors	
4	Portable closed-circuit TV units	
4	TV cameras for in-room use	To magnify demonstrations
3	TV cameras for multi-media room	
1	Rear-screen TV projector	
50	RAMP TV viewscreens	Capabilities for expansion to 100
10	Audio play-back devices	
20	Audio recorders (magnetic tape)	
100	Projector Carts	

TABLE 6.1 (Cont'd)

ESTIMATED RAMP MATERIALS AND EQUIPMENT NEEDS FOR INSTRUCTIONAL RESOURCES CENTER, SEATTLE COMMUNITY COLLEGE

Quantity	Item	Remarks
120	Projection Screens	1 per classroom; 1 in certain labs; multiples in certain rooms
2	TV Studios	Complete with cameras, dollies, microphones, etc.
2	Video Recorders	
1	Telephone Communications System	
1	Drafting table and Accessories	
1	Offset Camera	
——	Cameras	
1	Photo Dark Room	Complete
6	Transparency Producers	Various Types
1	Model Shop	Complete
2	Film Splicers and rewind	
2	Paper cutters	
1	Letter press	
1	Mechanical Lettering Set	
——	Supplies (film, paper, mounts, inks, etc.)	
1	Van type delivery vehicle	

Emerging Trends

The name applied to this facility—not "Library," but "Instructional Resources Center"—suggests a major contemporary philosophy which has recently evolved in the community college. The Instructional Materials Center is not to be considered a mausoleum for books; rather, it is an efficient, functional, rational grouping of all college services supporting instruction and learning. The metamorphasis of the library into such a center is perhaps the most dramatic and significant national trend in higher education.

Automation, which is affecting many activities, is also having an impact upon library operations. Data processing methods for indexing, title retrieval, status checking, posting over-due notices, recalling circulated volumes, determining circulation data, and other routine procedures are coming into widespread use. In a few instances, sophisticated information retrieval systems are being employed in college library units. The future will see even greater utilization of computer systems to support library operations.

The "information explosion" about which many observers have commented will have a serious impact upon an instructional resource center. Its bibliographic section will be taxed to process and store the burgeoning supply of relevant published materials. Ultimately, microforms will probably constitute a major fraction of the bibliographic holdings of the instructional resources center.

Electronic aids will become more integrally a part of the system for instructional resource centers. Electronic carrels, for example, are important supplements to the reading rooms; computer assisted instruction is an exciting substitute for rote reading of texts and references; and audiovisual devices are effective adjuncts to printed materials. More innovations will follow.

Personnel to be Housed

The personnel associated with the Instructional Resources Center will include RAMP personnel as previously specified plus the following:

1. Administrative Staff	1
a. IRC Director	
2. Bibliographic Staff	5
a. Reference Librarian	
b. Acquisitions Librarian	
c. Circulation Librarian (Books)	
d. Circulation Librarian (Microforms)	
e. Cataloger	
3. Clerical Staff	3
a. Secretary to IRC Director	
b. Typist	
c. Clerk	

4. Student Assistants and Library Aides	6
Total, excluding RAMP Personnel	15
RAMP Personnel	14
Grand Total	29

In addition, personnel of the following categories will use the facility:

Faculty

Approximately 250 faculty members teaching a wide range of courses will use the facility for personal preparation and as extensions of their classrooms in giving assignments to students.

Students

All 5,000 students in the college will hopefully focus on the Instructional Resources Center for individual or group study, research assistance and leisure reading.

Members of the Community

All resources of the community college, including this facility, will be open to the community members whenever such use by community members does not interfere with the instructional program of the college. An indeterminant number of citizens will use this facility.

Special Environmental Considerations

The Instructional Resources Center should have a "controlled environment." Lighting, temperature, humidity, air purity and noise levels must be rigidly controlled to produce the best possible environment for learning. The IRC should simultaneously beckon to passers-by inviting them to enter, and, once they cross its threshhold, focus their attention on its opportunities, removing outside distractions from their notice. The architecture must attract *and* hold.

Internally, the IRC should be carpeted in areas needing quiet. Interior glass—for visual supervision of patrons—may be indicated. Both freight and personnel elevators must be provided. Aisle space and door openings must be ample for book trucks. Insofar as possible, stacks should be used to subdivide large spaces. Exits must be controlled, in order that effective circulation accounting can be maintained. Ingress from delivery areas to work areas must be provided for. Smoking rooms should be provided; special ventilation methods must be used in these spaces.

Space Components of the Instructional Resources Center

Figure 6.7 shows the major components of the Instructional Resources Center. The figure is diagrammatic only; various considerations to be discussed later may influence the final design of these spaces and the relationships among them. Tables 6.2 and 6.3 list space recommendations for these areas. A brief description of each space follows in the next section of this document.

TABLE 6.2

SPACE GUIDELINES FOR THE INSTRUCTIONAL RESOURCES CENTER

Code	Description	No. of Units	Student Stations	Approximate Area (square feet)
A	Reading Rms. & Stacks	4	600	12,000
B	Periodicals and Ref.	1	80	1,600
C	Reserve & Reserve Desk	1	40	1,000
D	Microforms	2	10	1,200
E	Offices	6	——	650
F	Pro. Library	1	——	800
G	Faculty Reading Rm.	1	——	1,200
H	Teacher Ed. Classroom	1	——	900
I	Lobby & Display Area	1	——	1,800
J	Circulation Desk	1	——	210

TABLE 6.2 (Cont'd)

SPACE GUIDELINES FOR THE INSTRUCTIONAL RESOURCES CENTER

Code	Description	No. of Units	Student Station	Approximate Area (square feet)
K	Card Catalog[a]	1	——	400
L	Study Support	6	40	800
M	Carrels	200	200	4,000
N	Technical Processing	3	——	1,600
O	Conference Rooms	3	72	1,440
P	Great Occurences	1	——	1,500
Q	Music Rooms	4	16	320
R	Film Preview Rooms	3	30	600
S	RAMP[b]	15	——	3,860
T	Multi-media Theatre	1	(150)[c]	3,200
U	Special Collections	1	——	1,000
	Total		1,080	40,080

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[a] Main catalog only; division catalogs to be included in Reading Room Areas.

[b] Itemized separately; see Table 6.3.

[c] Not included in total of student stations.

FIGURE 6.7

COMPONENTS OF THE INSTRUCTIONAL RESOURCES CENTER

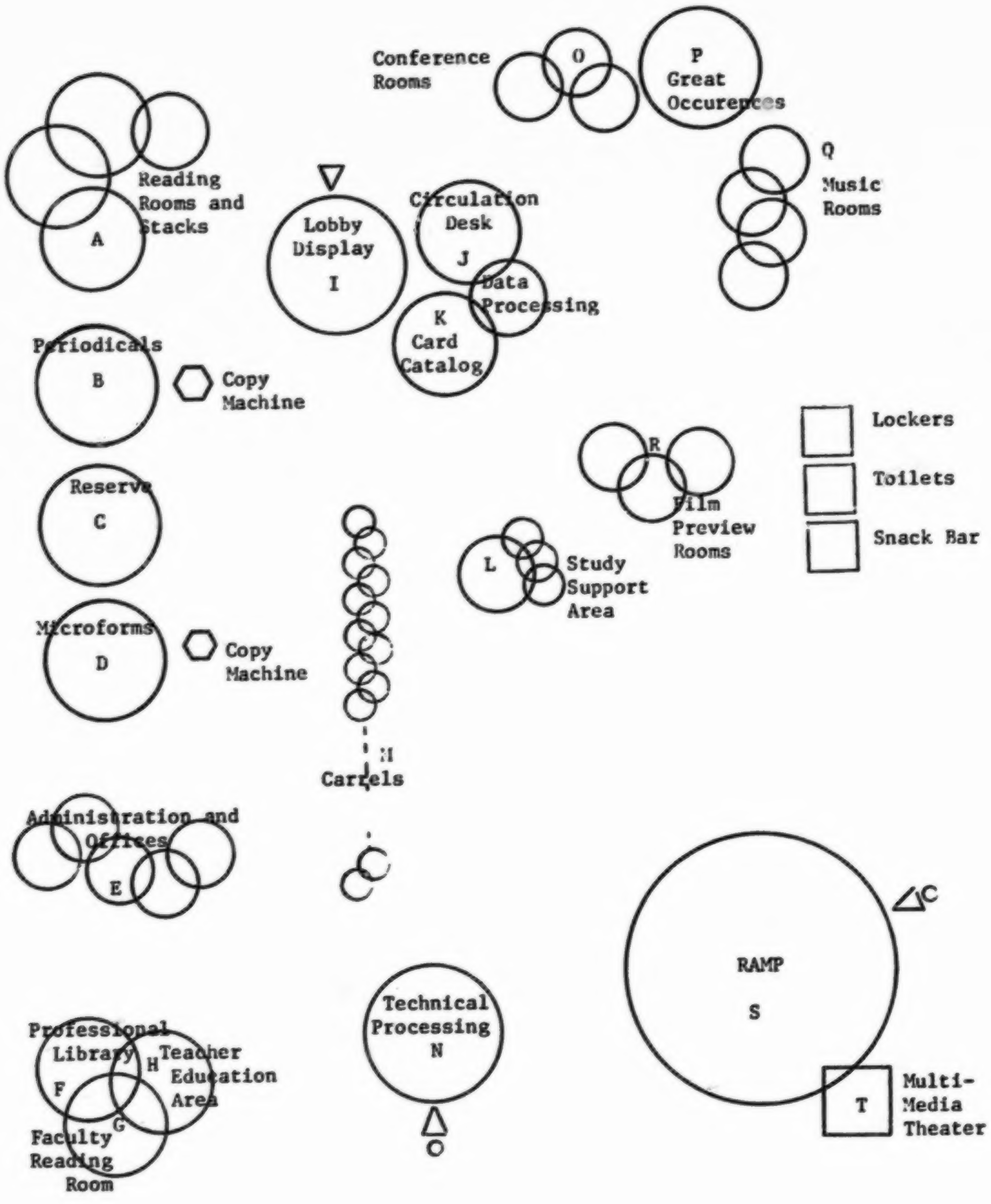
Conference Rooms
O
P
Great Occurences
Q
Music Rooms
Reading Rooms and Stacks
A
Lobby Display
I
Circulation Desk
J
Data Processing
K
Card Catalog
Periodicals
B
Copy Machine
Lockers
Toilets
Snack Bar
Reserve
C
R
Film Preview Rooms
L
Study Support Area
Microforms
D
Copy Machine
H
Carrels
Administration and Offices
E
RAMP
S
C
Technical Processing
N
O
Professional Library
F
H
Teacher Education Area
G
Faculty Reading Room
T
Multi-Media Theater

TABLE 6.3

SPACE GUIDELINES FOR THE FACILITIES IN RAMP CENTRAL

Code[a]	Use/Contents	Approximate Room Area (sq. ft)
A	RAMP Director's Office	150
B	Secretary, Cataloger	120
C	RAMP Library (Catalog, Files of Source Documents, Film Library, etc.)	300
D	Print Shop (Mimeo, ditto, Xerox, Offset, hand press, etc.)	200
E	Model Shop (Wood-and-metal-working equipment, painting, etc.)	200
F	General Production Area (Transparency production, slide mounting, drafting and art, film splicing, etc.)	400
G	Photo processing area (copy cameras, etc.)	120
H	Photographic Dark Room (Developing, Printing, Enlarging, etc.)	80
I	TV Director's Office	150
J	TV Studio No. 1 (12′)	300
K	TV Studio No. 2 (12′)	800
L	Visitor's Viewing Room	120
M	Supporting Equipment Room (Video tape Recorders and Players, Film Strip projectors, Film chains, test equipment, etc.)	200

TABLE 6.3 (Cont'd)

SPACE GUIDELINES FOR THE FACILITIES IN RAMP CENTRAL

Code[a]	Use Contents	Approximate Room Area (sq. ft.)
N	Control Room (Switching gear, channel selectors, telecommunications to receptor stations, controls for studios, etc.)	400
O	Storage, Repair, Distribution Area (shelving for storing RAMP apparatus, for repairing and maintaining it and dispatching it on schedule to classrooms; includes loading ramp for delivery vans.)	320
	Total	3,860

---

[a] Codes are keyed to symbols on Figure 6.3.

Descriptions of Spaces

In the following paragraphs, descriptions of each of the major space components of the Instructional Resources Center, other than RAMP, appear. Broad guidelines for furniture and equipment are also given. These descriptions are keyed to the entries in Table 6.2.

A. Reading Rooms and Stacks

As many as four reading rooms of size varying from 1,000 sq. ft. to 4,000 sq. ft. may be provided. One of these, probably the smallest, should be an area in which smoking is permitted. Seating for 600 students should be provided in these spaces. These spaces need not be separated by walls; arrangement of stacks and furniture can accomplish a functional separation. The floors should be carpeted. Both table-and-chair and lounge furniture should be provided. Some of the carrels (see below) may be added to these spaces. Ceiling and wall treatment should help in sound suppression so that quiet conversation can be permitted in these areas. The stacks shall accommodate 30,000 volumes.

B. Periodicals and References

Bound periodicals and reference works should be housed in a collection convenient to the reading rooms. The reference librarian should have an office nearby and a desk in the area. A photocopy machine should be available, preferably with free copy service. Close supervision of reference works is desirable. Carrels, chairs and reading areas may be incorporated into this space. Shelving in this area should be compact, rugged and adaptable to varying arrangements. The stack capacity is projected to be 8,000 volumes. Seating for 80 students should be incorporated into the area.

C. Reserve and Reserve Desk

This area is anticipated to be a major circulation area. Some seating for use of "room reserve" books should be provided, but the major activity here will be check-out and check-in of the reserve collection. Forty seats are expected to be adequate. A desk for a professional librarian or a library aide must be incorporated. Current periodicals may also be included here.

D. Microforms

The two units provided here must be designed (1) to store microform materials (microfilm, microcard, microfisch) with an index, and (2) to house optical reading equipment and photocopy equipment for use of the microforms. Light control in the optical reading area is necessary. Approximately 300 sq. ft. is required for microform storage; 900 sq. ft. can be made available for use stations. Approximately 20 such stations may be provided. A library aide should be on duty at all times; hence, a work station for this individual must be provided, preferably in the storage area.

E. Offices

The offices and/or work spaces required and the approximate area of each are as follows:

1. IRC Director	150 sq. ft.
2. IRC Director's Secretary	120 sq. ft.
3. Acquisitions Librarian	80 sq. ft.
4. Reference Librarian	80 sq. ft.
5. Cataloger	80 sq. ft.
6. Circulation Librarians	80 sq. ft.
Total	590 sq. ft.

The acquisitions librarian and the cataloger should be located near the technical processing area, which in turn should be convenient to delivery. The circulation librarian should be near the main circulation desk. The reference librarian should be located near the periodical-reference room. In addition to these offices, work spaces for clerical works should be provided in the technical processing area.

F. Professional Library

This space will house a small collection of books, journals and documents related to the professional role of community college faculty members. It should contain stacks and lounge furniture, should be carpeted, should be contiguous to the faculty reading room and may be incorporated into it. A small card catalog is required. It will preferably have ingress other than from the main lobby. This space will be used exclusively by the faculty. A few seats should be provided, perhaps 10 will be adequate.

G. Faculty Reading Room

This space, like that described in F above, is for exclusive faculty use. It should be carpeted, contain lounge furniture as well as conventional reading room furniture, have a small pullman kitchen (20 sq. ft.) for coffee service, have an adjoining faculty toilet and have ingress other than from the main lobby. It should lend itself to meetings of faculty committees, to discussion groups and to inspirational reading by faculty members. Seating should be provided for thirty persons.

H. Teacher Education Classroom

A classroom for 40 persons, which should accommodate in-service teacher training functions of the institution and also be useful for large faculty committees or special forums in which limited numbers of faculty or others are involved. Tiered seating, strip tables, carpeting, careful acoustical treatment and full capability for RAMP services should be provided.

I. Lobby and Display Area

An entrance area convenient to the main circulation area, near elevators and near lockers and toilets should be provided. Displays for new books, special collections, art pieces and the like can appear here.

J. Circulation Desk

This will be a heavy traffic area. Work spaces for a professional librarian and student aides must be provided. Data processing terminals may be installed at this location.

K. Card Catalog

In addition to the conventional card files, counter space for student use should be provided. A work station for a professional librarian should be nearby. Approximately 75 drawers will be required to index the collection.

L. Study Support Area

Six small rooms are suggested. Some of these should contain typewriters and typing desks, stenographers' chairs and bookshelves; these rooms should be soundproofed, but must allow visual supervision. Other rooms should contain tape recorders and play back equipment. Tables and chairs or carrel furniture are suitable. These, also, should be soundproofed and should allow for visual supervision. Forty stations should be distributed through these spaces.

M. Carrels

At least 200 individual carrels should be provided. These may appear in any area of the facility, many of them in close relationship to the main reading rooms.

N. Technical Processing

Work stations must be provided for receiving, classifying, numbering, repairing and distribution of holding. A small bindery may be required. Three rooms with suitable work tables, storage facilities and book shelves will suffice. One of these rooms should have direct ingress from a delivery station, and one must open to a freight elevator. Two work stations per room are recommended.

O. Conference Rooms

Three conference rooms, carpeted, to accommodate up to 25 persons each should be provided. A movable partition wall between two of these will allow for a larger conference area, if needed.

P. Great Occurrences

This room should be a formal parlor-reception area, reflecting in its decor the seriousness and dignity of the function for which it is intended. A pullman kitchen should be included for snack service. Storage for cups, plates and silverware must be provided. A walk-in coat closet-checkroom is desirable. The pullman kitchen should be accessible to a pick-up and delivery area from central food service; delivery of food and dishes will be arranged through central food service.

Q. Music Rooms

Sound-proofed cubicles for listening to audio disks and tapes, monaural and stereo, with high fidelity sound systems, should be provided. Approximately four of these rooms, with four student stations each, are recommended.

R. Film Preview Rooms

These spaces should have a rectangular aspect with a relatively exaggerated major dimension. (10 ft. by 20 ft. is suggested.) From 8 to 10 persons should be able comfortably to preview slides, films, filmstrips, etc. in each of these areas. Storage for the associated projection equipment should be nearby. Soundproofing and light control are essential.

S. RAMP

Spaces for RAMP will be described in a subsequent section.

T. Multi-media Theater

This space may be remote from the IRC building but will be administered as a part of the IRC-RAMP system. Its requirements are elsewhere described.

U. Special Collections

A space should be provided for the housing of special collections, rare books, art objects on loan, exhibits and the like which are part of the IRC program projected for the college. The archives of the college may well be stored in this area. Provision must be made for adequately safeguarding rare materials.

Space Descriptions for RAMP

In the following paragraphs are described the specialized facilities which are related to RAMP; the codes which appear preceding the title of each space are associated with the entries in Table 6.3.

C. RAMP LIBRARY—This is the storage space for the materials to be used in the RAMP system. Films, filmstrips, video and audio tapes, photographs, maps, transparencies and bibliographic materials all are to be stored here so that a variety of cabinets, shelves and files for special purposes will be provided. Access to this library will in general be limited to the professional personnel of RAMP so that the emphasis for this space is on maximizing capacity, not on possible traffic patterns.

D. PRINT SHOP—RAMP will use this space for the production of hard copy materials by means of ditto machine, mimeograph, photo-offset or multilith techniques. One each of the appropriate machines plus a photocopier will be required. Adequate storage for paper, ink and other supplies must be provided. A work table (approximately 4 by 6 feet) should be provided for collation.

E. MODEL SHOP—The model shop is intended for the production in wood, metal and plastic of small, three-dimensional models for instructional purposes. It should contain a radial arm saw, a jointer and planer, a small wood lathe, a small metal lathe, a drill press, and a work bench with a vise and a complement of hand tools. A small compressor for use with spray-painting should be included.

F. GENERAL PRODUCTION AREA—This area should contain three major work stations; a drafting table, a work table for checking and splicing film, and a work table for manufacturing and mounting transparencies and overlays. In-room storage for supplies must be provided. Illumination level must be 80 ft. candles at table height.

G. PHOTO PROCESSING AREA—This area is for the use of copy cameras, the production of filmstrips and other 35 mm films, titling of movies and other photographic operations. A counter along one side of the space will provide for adequate work surface and in-room storage. The floor should be kept relatively free in order that camera tripods can be placed and moved easily.

H. PHOTOGRAPHIC DARKROOM—This space should be equipped with a sink, developing trays, enlarger, printer, dryer, storage for chemicals and supplies and safe-lights. It should be lightproof and have an "in-use" warning system.

I. TV STUDIO NO. 1—This small studio is for the live presentation or recording of productions which involve few scene changes. It should be equipped with two cameras, a system of overhead lights and free space for the placement of sets. It should have one internal monitor. Visual access from the control room is essential. The "Visitors' Viewing Room" (see below) should overlook this studio. A 12 ft. clearance of the ceiling is mandatory.

J. TV STUDIO NO. 2—This larger studio is for the live presentation or recording of productions which require either a number of scene changes or a relatively large number of persons. This studio should be equipped with three cameras, have a system of overhead lights, have a rear projection screen for the production of backgrounds and be accessible from both the control room and Studio No. 1. The visitors' room should overlook the area. A 12 ft. clearance (or more) of the ceiling is mandatory.

K. VISITORS' VIEWING ROOM—This space is provided for the convenience of visitors who wish to view a TV program in production. It should have visible access to the studios and be equipped with a monitor. It may be equipped with lounge furniture.

L. SUPPORTING EQUIPMENT ROOM—This space will house the film-chains, projectors, tape units and other technical gear necessary for the operation of the closed circuit TV system. It is the heart of the image initiation system.

M. CONTROL ROOM—The control room must have visual access to both studios. It will be equipped for stations for three operators. It will have monitors, switching gear and auxiliary apparatus. It will connect with the telecommunications system which extends to the classrooms. Audio communication with each of the cameramen is required. Studio lights should be controllable from this station.

N. STORAGE AND DISTRIBUTION AREA—Adequate space for the storage, testing, repair and maintenance of all equipment, such as projectors, tape recorders, in-room TV systems and models must be provided. Access from this area by a van or other delivery vehicle is essential. Storage for supplies of lamps, spare parts and other accessories should be provided. The space should include one work bench for the repair function.

VII

FACILITIES FOR ORAL AND WRITTEN COMMUNICATIONS

Philosophy and Objectives

The curriculum for this area includes course offerings in the areas of speech, journalism, composition, literature and foreign language. In addition, it covers oral and written communications in Occupational Education as a part of the general education for occupational students. Courses for community services are discussed elsewhere in this Report. Communications, probably more than any other curricular area, is a college-wide consideration. Because of the very comprehensive base of this program, which affects practically all students enrolled in the college, the objectives include not only the teaching of basic skills (i.e. reading, writing, speaking and listening), but also the teaching of more complex skills as well (i.e. writing and speaking logic, inductive and deductive processes, research methods, technical report writing, parliamentary procedure, etc.). In addition, this curricular area includes teaching aimed at improving the student's effective habits and appreciation for poetry, outstanding literature, creative writing and other languages and cultures.

The Educational Program

Occupational Education Related

Three courses in communications which are to be offered as a part of the Diploma and Associate Degree Programs for the various occupational curriculums include:

1. Communications Skills (two courses)
    a. Development of correct habits in speaking, writing, reading and listening; speech analysis, group speaking; outlining, note-taking, summary reports, conventional usages in mechanics and grammar.
    b. Improvement of speaking, reading, writing and listening for greater competency in the communication of ideas and thoughts.

2. Public Speaking

Development of speaking skills; preparing speech for specific audiences; individual speeches and group discussions; poise and self-confidence in public speaking.

Additional courses may include technical report writing, discussion methods and persuasive speech.

College Parallel Related

The courses to be offered by the college which support the college parallel programs include:

Communications
Dramatic Literature
Business Reports
American Literature
Advanced Grammar
Poetry
English Communication
Contemporary World Literature
Technical Writing
English Literature
Fiction
Creative Writing
World Literature

In addition, 9 quarters each are offered in French, German, Spanish and Russian. It is conceivable that third year languages will be offered at Seattle Community College in the future. In addition, at least one other foreign language selected from either the Oriental or Scandinavian areas may be offered.

In the area of Speech, it is anticipated that the following courses will be offered:

General Speech
Debate
Parliamentary Procedure
Listening Improvement
Public Speaking
Group Dynamics
Oral Interpretation
Basic Speech Improvement

In the area of Journalism, courses in Newswriting and College Publications will be offered.

Teaching and Learning Activities

Instructor Activities

Instructor activities will include lecturing, answering questions, leading discussions, demonstrating devices and communications lab equipment, using visuals and audio-visuals, supervising student performance, giving individual assistance to students. In addition, instructor activities will include using the chalkboard, speaking, listening. criticizing, and using communications lab console equipment. Closed circuit television may be used when appropriate. When the need for additional developmental or therapeutic instruction is identified, individualized instruction will be used.

Student Activities

In general, student activities will include listening to lectures, taking notes, participating in discussions, writing creatively, using communications lab or language lab electronic equipment and tapes, speaking, debating, reading for others, visuals and audio-visuals, using tachistoscopes and other mechanical tools.

Emerging Concepts and Developing Trends

In addition to the changing emphasis upon large groups, small groups and individual instruction, we perceive that the future will bring a trend toward the restructure of communications pedagogy bringing about emphasis on the four fundamental communications skills of reading, writing, speaking and listening. We may well find a decreasing emphasis upon the presently structural atomistic approach to the teaching of communications.

In addition, the curriculum of the future may well reflect a merging of the total communications program (whether for Community Service, Occupational Education or College Parallel education) into one curricular structure with courses and/or other segments of learning designed to provide skill and training appropriate to the individual student's goal.

Finally then, it can be expected that in the future that the efforts in the area of communications and the structure of the activities will be concentrated more completely with the teaching of reading, writing, speaking and listening. Other objectives which today are included in the teaching of communications could well be left to others. Thus, teaching for logical organization, inductive and deductive reasoning and research methods might better be left to the teaching of math, logic and the sciences. In addition, the teaching of effective habits and appreciations might better be left to the teaching of the Fine Arts, History, Sociology and Psychology. This suggests that courses in literature, fiction and perhaps poetry will be taught in the future by departments other than communications.

Student Groups

Number of Students;
Estimates of Clock Hour
Usage of Facilities

Data collected on the nature of the community college and the experiences of other colleges in enrolling students in the area of communications suggest the student populations for this college unit shown in Table 7.1. The instructional staff required by such an enrollment is also shown in this table.

TABLE 7.1

PERSONNEL ASSOCIATED WITH COMMUNICATIONS

Area	Projected Equivalent Student Enrollment	Instructional Day Staff Requirement
Occupation-related Communications	150	6
Foreign Languages	100	4
Transfer-related Communications	350	14
Community Services	(a)	(a)
Total	600	24

Although it is difficult at this point to estimate separately the need for laboratories and general classrooms, it is necessary to begin by making some assumptions.

Assuming that a laboratory will be used approximately 20 hours per week, that a general classroom approximately 27 hours per week, that the average student generates about 18 indoor contact hours per week and that approximately 1/3 of the contact hours produced in communications will be laboratory hours, the following calaculations can be made.

The total enrollment of 600 students will generate about 10,800 contact hours per week. Of these, 3,600 will be lab hours while 7,200 will be classroom hours. Thus, 180 lab student stations and 266 classroom student stations will be required to produce the total contact hours per week.

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[a] Discussed in the section on Community Services.

Class Sizes

For language and communications lab instruction, students will generally be grouped in sections which will vary from 10 to 45 individuals.

General classrooms for lecture, discussion, writing and reading activities should provide for two grouping modes, 24 and 40. In addition, several spaces should be available for individual and small-group activities. These will provide space for small advanced language sections, problem speech or speech therapy activities, reading therapy activities and small-section creative writing instruction.

Faculty and Staff

Table 7.1 shows the number of faculty members projected to be associated with the communications curriculum. It is suggested that, in addition to the 24 faculty members previously listed, there will also be a need for two supervisory positions, one secretary/receptionist, two clerk typists and 18 evening school faculty members. These estimates are summarized in Table 7.2.

Specialized Spaces Needed to Implement the Instructional Program

The specialized spaces needed to implement the instructional program in Communications include four Communications Laboratories for Speech and Modern Languages and one Communications Media Preparation Studio. It should be noted that these four communications laboratories might well be designed for one common physical area. This would allow greater freedom in the use of the individual carrels. Figure 7.1 displays these specialized areas along with the other spaces recommended for this college unit. Table 7.2 summarizes the characteristics of these spaces. Subsequent paragraphs describe special aspects of each space.

Individual Space Considerations

It is strongly suggested that the general classrooms, seminar rooms, offices and laboratory areas recommended in this chapter reflect, where possible, the four main elements of communications: *reading, writing, speaking and listening.*

The decor and aesthetics of the space should reflect and give emphasis to the four main elements of communications. Both the general area and the specific spaces should be decorated so that visually and conceptually the space reflects the "world of communications."

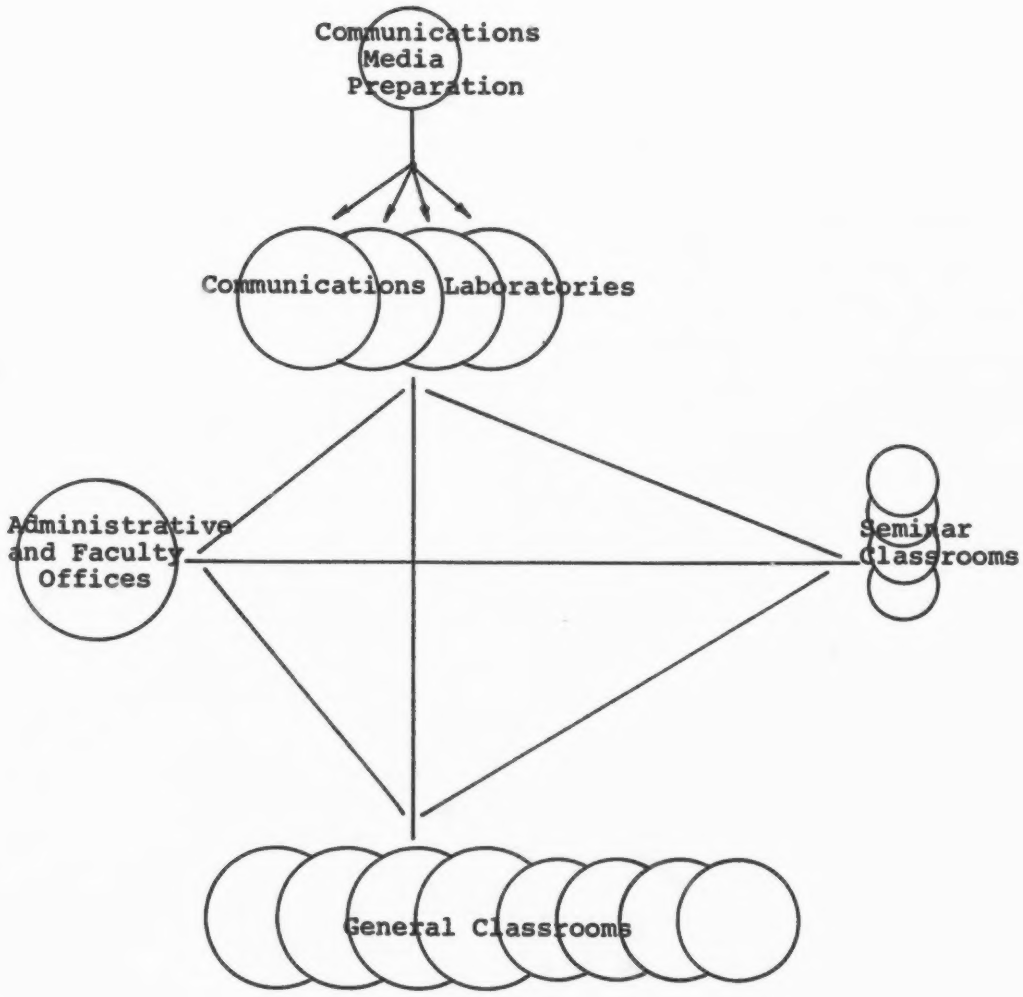
TABLE 7.2

SPACES REQUIRED TO SUPPORT ORAL AND WRITTEN COMMUNICATIONS

Type of Space	Units	Area Per Unit	Student Capacity Per Unit	Ttl. Cap.	Ttl. Area Sq. ft.	Anticipated Hours Daily Usage This Department
Instructional (Specialized)						
Communications Labs.	4	1,600	45	180	6,400	8
Subtotal	4			180	6,400	
Instructional (Non-Specialized)						
General Classrooms	4	800	40	160	3,200	8
General Classrooms	4	480	24	96	1,920	8
Seminar Rooms	4	400	15	60	1,600	6-8
Subtotal	12			316	6,720	
Auxiliary						
Communications Media Preparatiton Studio	1	200	--	--	200	
Subtotal	1	200	--	--	200	
Offices						
Supervisor's Ofc.	1	120	--	--	120	
Supervisor's Ofc.	1	120	--	--	120	
Faculty Offices	24	80	--	--	1,920	
Part-time faculty spaces	18	20	--	--	360	
Secretary's Office	1	120	--	--	120	
Clerk-Typist Offices (2 persons)	2	80	--	--	160	
Subtotal	47			--	2,800	
Total	64			496	16,120	

FIGURE 7.1

RELATIONSHIP OF SPACES WITHIN THE AREA OF ORAL AND WRITTEN COMMUNICATIONS


Communications Media Preparation
Communications Laboratories
Administrative and Faculty Offices
Seminar Classrooms
General Classrooms

Requirements for the following types of spaces follow:

1. 4 Communications Laboratories; two of which should be record and playback, one for reading and one for writing.
2. Communications Media Preparation Studio
3. 4 24-Student Station Classrooms
4. 4 40-Student Station Classrooms
5. 4 Seminar Rooms

Communications/Language Laboratories

It is recommended that four of these spaces be provided. Each space will require 1,600 square feet of assignable area. Each space should be designed for use by one instructor and 45 students.

Primary Function

These spaces are intended to be used primarily for the study of languages and speech. Although heavy scheduling is anticipated in these laboratories, unscheduled use of the equipment by individuals should be possible during most hours of the day and evening. As has been previously noted, these four laboratories should be designed for one common space. In addition, the four master consoles should have the capability of controlling any given number of carrels at any particular time.

Additional Student Activities to be Housed

1. Threading tape decks
2. Using microphones and earphones
3. Listening, talking
4. Reading aloud

Additional Professional Activities

1. Operating communication console
2. Storing tapes
3. Using microphone and earphones
4. Talking, listening

Equipment and Furniutre, Built-In

1. Standard lighting treatment
2. Acoustical treatment; walls, ceiling and booth partitions
3. Cooling and ventilation requirement due to electronic equipment
4. No window requirements
5. Standard door treatment with small window
6. 40 standard communications lab booths with countertop, built-in tape deck, slide-down front partition
7. Master communications console in place of regular instructor station
8. Chalkboard, 8 lineal feet at front of space
9. Tackboard, 4 lineal feet

Equipment and Furniture, Movable

1. 40 student chairs (no arms)
2. 1 upholstered swivel chair for instructor
3. 1 standard tape storage rack

Communications Media Preparation Studio

This space will require 200 square feet of assignable area. The space should be divided into two tape-preparation areas. Both areas should be soundproofed.

Primary Function

These spaces are intended to be used for the recording of language and speech tapes.

Additional Professional Activities

1. Operating tape recording equipment
2. Speaking
3. Reading

Equipment and Furniture,
Built-In

1. Standard lighting treatment
2. Acoustical treatment; walls, ceiling
3. Cooling and ventilation requirement due to "closed room" usage and electronic equipment
4. No window requirement
5. Acoustical door treatment, with small window
6. Tackboard, 4 lineal feet
7. Chalkboard, 8 lineal feet
8. Possible "in-Use" warning light because of nature of activity

Equipment and Furniture,
Movable

1. 6-foot office work table
2. Standard tape storage cabinet
3. 5-drawer legal file
4. Standard office storage cabinet
5. 3 standard arm chairs
6. Tape recording and playback equipment for 30 students in each
7. Thirty carrels per room to house recording and playback room equipment

40-Student Station
General Classroom

It is recommended that four of these spaces be provided. Spaces should be equipped with 16 lineal feet of chalkboard and 8 lineal feet of tackboard. Window, door, lighting, acoustical and electrical requirements are standard. Heating, cooling and ventilation requirements are also standard. These spaces should be equipped with 40 individual student tables and chairs. An instructor's table and chair is required in each space.

24-Student Station
General Classroom

Same as above except that 24 individual student tables and chairs are to be provided.

Seminar Rooms

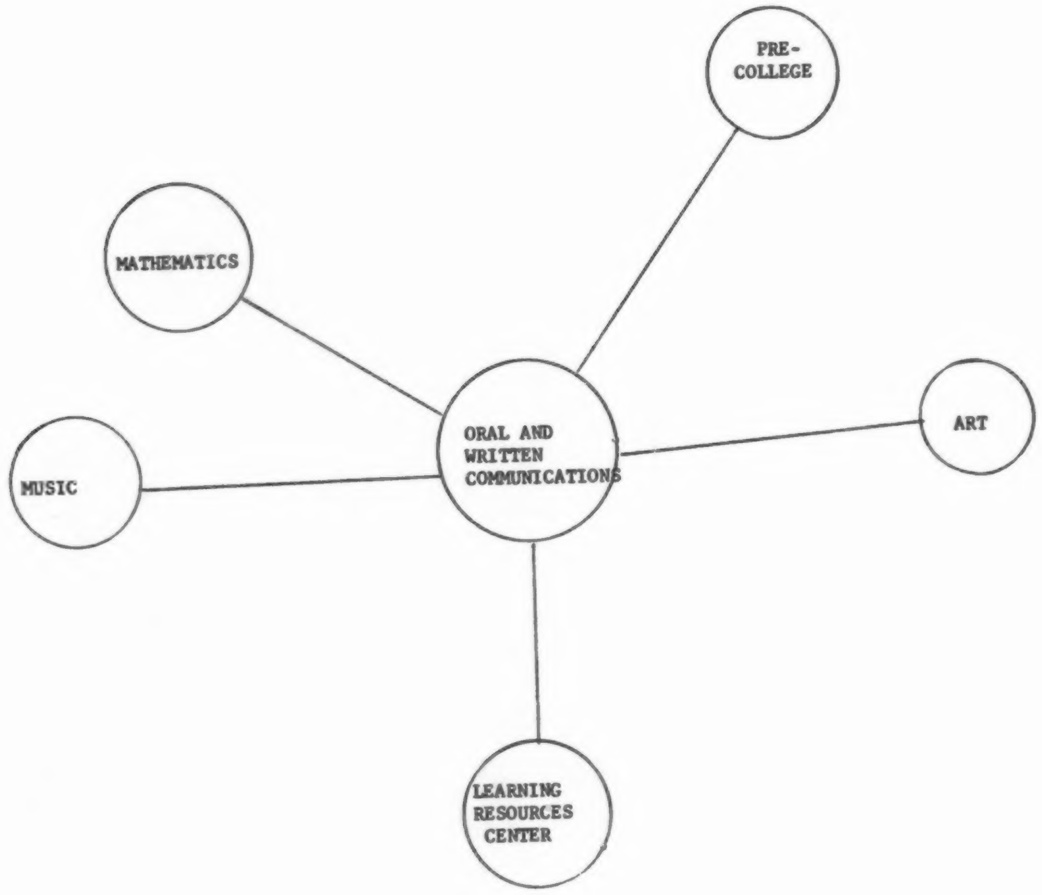
It is recommended that four of these spaces be provided. Spaces should be equipped with 16 lineal feet of chalkboard and 8 lineal feet of tackboard. Window, door, lighting, acoustical and electrical requirements are standard. Heating, cooling and ventilation requirements are also standard. Conference tables and chairs for 16 persons are required.

Functional Relationships

Figure 7.2 is a diagram which shows the desirable functional relationships of facilities proposed for the oral and written communications program.

FIGURE 7:2

RELATIONSHIP OF ORAL AND WRITTEN COMMUNICATIONS WITH FACILITIES OF OTHER PROGRAM AREAS


PRE-COLLEGE
MATHEMATICS
ORAL AND WRITTEN COMMUNICATIONS
ART
MUSIC
LEARNING RESOURCES CENTER

VIII

FACILITIES FOR MATHEMATICS

Philosophy and Objectives

The mathematics program will serve all the students attending Seattle Community College. Courses in this program will be required of students seeking either an associate of arts and the diploma and associate of applied science degree in occupational education. In addition, many of the adults enrolled in the high school diploma program will be expected to complete some mathematics courses.

In general the basic purpose of the mathematics program will be to provide the students with an understanding of basic mathematical principles and their application to specific problems in scientific, economic and other related fields. Experience in problem solving, in reasoning logically and in relating mathematical concepts and methods to life situations is equally essential. The development, expression and evaluation of abstract concepts involving quantitative relationships is also one of the main purposes, especially for the pre-professional students.

The need for the mathematics program is generally clearly understood for the pre-professional student and especially those planning careers in mathematical and scientific areas. In occupational programs as well as in community service programs of many types, the importance of mathematics should also be equally evident. To read intelligently, to understand the intricacies and pitfalls of credit buying, mortgages and insurance, and indeed even to adequately manage family accounts requires an increasing understanding of mathematics. The community college that serves the wide range of student needs referred to above, therefore, must have these broad objectives.

Course Descriptions

The mathematics courses fall roughly into two groups (1) those especially required for admission to or continuation in a major field. These ordinarily have a defined sequence with the earlier course prerequisites for the later ones and (2) those designed to serve in certain occupational or community service programs. Usually in these instances, a certain level of competency is required rather than a specific number of courses or credits.

Teaching and Learning Activities

Teaching and learning activities in mathematics in junior colleges have changed considerably in recent years. The focus may still be on developing understanding and ability to apply mathematical concepts and procedures. The major change, however, is more in the emphasis and the methods.

Data processing makes new demands for increased knowledge in the areas of number theory, probability and relationships; the increased availability of technical equipment makes self-teaching and self-testing of some types of factual quantitative material much easier. These are two examples of change that need to be accommodated in planning for mathematics facilities in this community college.

Some Guiding Principles

The following principles appear especially pertinent to mathematics and the planning of mathematics facilities.

1. Classroom size does not vary as greatly for mathematics as for certain other subjects in the community college.
2. The range of mathematics ability of entering freshmen will be extremely large.
3. Possibly no field has greater need for developmental or remedial programs than mathematics.
4. As in other subject areas, provision must be made for offices for full- and part-time faculty.
5. Facilities for self learning, self testing and tutorial areas are essential.

Student Groups

It is anticipated that approximately 1,518 student contact hours of time will have to be accommodated on the North Campus for academic students. This represents approximately 51 class periods in classes of 30 students each. Other needs will increase this requirement by 1/3 of this amount.

Much of the enrollment will be from students enrolled in the associate of arts transfer program. However, as indicated earlier, students will be drawn from all programs of the college.

The entering students will have wide variations in their mathematical ability and skills. This will neces[illegible] [illegible] attention to pre-testing, groupings, tutorials and the increased use of electronic technical equipment for learning and testing.

Faculty and Staff

The space requirements for the offices and work space for mathematics are shown below.

Types of Space	Number of Units	Area per Unit (sq. ft.)	Total Sq. ft.
Supervisory offices	1	120	120
Faculty offices	10	80	800
Part-time faculty	2	40	80
Secretary's office	1	120	120
Total	14		1,120

The administrator and each of the ten full-time faculty would each have an office and the four part-time faculty would share two offices. For the part-time faculty, one should have use of the desk Monday and Wednesday and the other member of the team should use it Tuesday and Thursday. The recommended 40 square foot office for the part-time faculty office should have in addition to a chair and desk or built-in desk space, an overhead storage space 36″ to 42″ long, 18″ high and 14″ to 18″ deep divided in two parts with door locks for the two faculty members.

Each full-time faculty office should be furnished with:

1. Office desk
2. Cushioned chair, 2 additional chairs
3. File cabinets
4. Built-in shelves for books on one wall
5. One wall with 6′ blackboard
6. Telephone
7. Coat rack (not necessary, if provided for elsewhere)

Space Needs for Classrooms

It is anticipated that much of the mathematics instruction will be carried on in classrooms planned to accommodate 15 and 30 students.

Wherever possible, there should be chalkboards on three sides of the room. Consideration should be given to constructing partitions so that as needed, the size and shape of the classrooms can be changed. Attention should certainly be given to a reasonable degree of sound isolation. Movable tables, chairs and desks are essential as well as RAMP services. Visual access beyond the space is not restricted.

The clasroom space needs are given below:

Number Units	Number Students Per Unit	Space Per Unit	Sq. Ft. Total Space
6	30	600	3,600
3	15	400	1,200
9			4,800

Space Needs for Tutorial Laboratories

Tutorial laboratories of 400 square feet each should be provided to house 15 students each. The laboratories should be in close proximity to the offices of the full-time faculty. The appropriate use of desks or tables depending on the type of program in tutorial mathematics and the availability of equipment for audio visual purposes are essential. Three of the tutorial laboratories would be adequate.

Summary of Space Needs for Mathematics

The total net square footage needed for mathematics facilities on the North Campus is shown below:

Classrooms	9	4,800
Offices	14	1,120
Tutorial labs	3	1,200
Total Net Square Footage		7,120

Environmental and Utility Requirements

All mathematics instructional spaces should meet the following environmental and utility requirements:

1. Ventilation adequate for comfort with windows closed
2. Adequate lighting
3. Sound and light control to permit use of audio-visual equipment

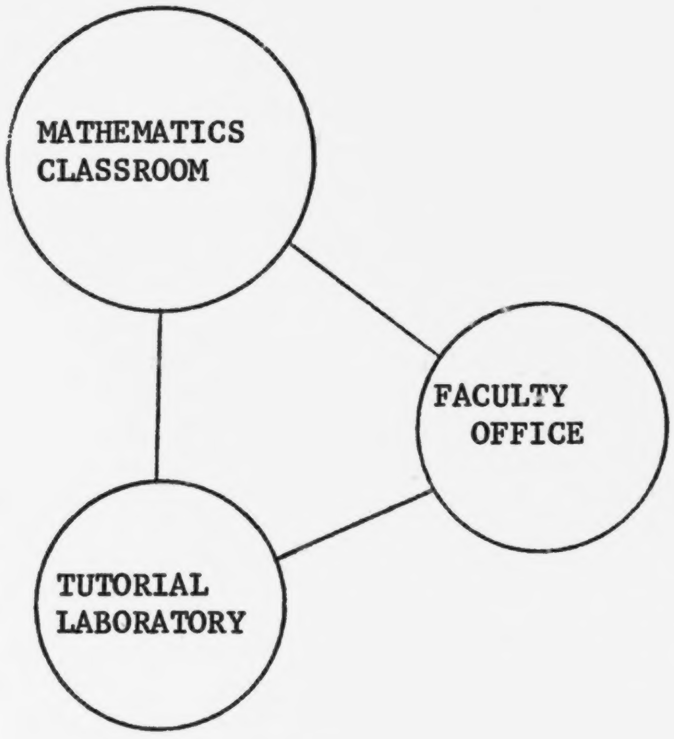
4. Room controlled heating and ventilation
5. Electrical outlets every ten feet
6. Equipped for:
   (a) RAMP media
   (b) Reception of closed circuit and broadcast TV

Description and Diagram of Functional Relationships

The mathematics facilities will have a close relationship to science and engineering, to engineering-related and business-related technologies and in a more limited degree to other programs. Within the mathematical facilities themselves, the necessity of having the tutorial laboratories adjacent to the offices can not be overemphasized. The tutorial facilities should be wired to accommodate the present and future use of electronic equipment for self testing. The tutorial laboratories when not in use for this purpose can be used for seminars, planning groups and demonstration work.

Figures 8.1 and 8.2 are diagrams which depict the functional relationships of the facilities for the mathematics program.

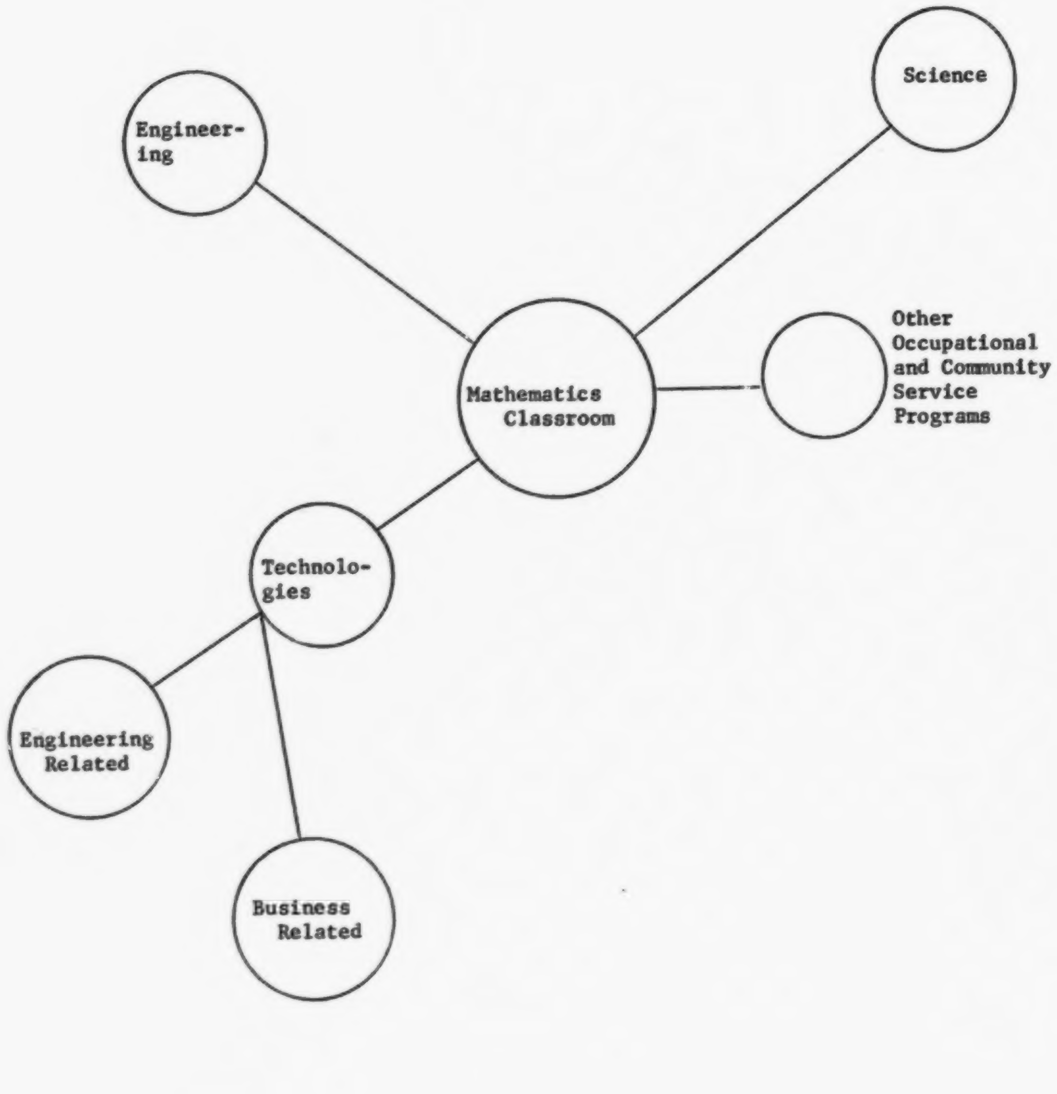
FIGURE 8.1
INTERNAL RELATIONSHIPS OF MATHEMATICS FUNCTIONS


MATHEMATICS CLASSROOM
FACULTY OFFICE
TUTORIAL LABORATORY

3

FIGURE 8.2

RELATIONSHIPS OF MATHEMATICS FUNCTIONS TO OTHER CAMPUS FUNCTIONS


Science
Engineer-
ing
Other
Occupational
and Community
Service
Programs
Mathematics
Classroom
Technolo-
gies
Engineering
Related
Business
Related

IX

COMMUNITY SERVICES FACILITIES

Philosophy and Objectives

The College is committed to serve the instructional needs of the adult population of the area surrounding the campus. This will be done by offering instruction-related activities and courses of instruction based on the interests and needs of the adult community. Some of these will involve attendance at a single lecture or seminar; whereas, others will consist of several meetings held either in succession or at scheduled times with intervals between. Some of the activities of the community services program will not coincide with the regular College calendar.

Primarily this will be an evening and weekend program. Some aspects of it will be conducted at locations other than the College campus. However, there are adults in the community who must be served on campus during the daytime if they are to be reached. This latter group includes wives, persons who work night shifts and retired people. For this reason, some facilities for this program must be available on campus during the daytime.

Several factors will determine the magnitude of the community services program. One will be the extent of need for adult elementary and secondary level education. Another will be the degree of community interest in instruction related to cultural and leisure time activities. Still another will be the instructional needs of special groups in the community, such as businessmen and housewives. Finally, the availability of a qualified instructor will, in the last analysis, determine if an instructional activity or course can be staffed.

The Curriculums

As indicated in the previous section, activities of the community service program are diverse in nature. They can be classified as follows:

1. the adult basic education (elementary school level) program
2. the adult high school diploma program
3. special interest short courses which will range from a seminar on citizenship to preparation for naturalization

4. the cultural program, which will range from adults of the community attending College programs to Great Books and special art courses
5. English as a second language for those from non-English speaking countries
6. advanced college-level courses, which extend beyond the level of the regular College program, for groups with special needs and interests

Experience has shown that there is a need for the adult basic education (elementary school level) program to be offered in the immediate neighborhood of those it is intended to serve. To a considerable extent, this is also true of the adult high school diploma program which is currently functioning well as an evening program in the high schools. However, adults who must take such work in the daytime cannot do so in local district schools because their facilities are not available at that time. The College needs to provide facilities for these groups because school facilities are not available otherwise during the daytime for these purposes.

Teaching and Learning Activities

As already implied, the adults who participate in the community services programs will come from widely varied backgrounds. In addition, the activities themselves will be widely divergent. Many students in the adult basic education and high school diploma programs will have experienced educational failure. Imaginative teaching is required to motivate such individuals and to help them succeed. Further, it is important that they have frequent evidence as to their progress. At the same time, many of them are impatient and want to progress as rapidly as possible toward their established goals. These factors necessitate well organized teaching, presenting ideas in a variety of ways and by different media and frequent evaluation of achievement. Students in these two programs cannot be lectured to exclusively with good results. They need to apply ideas as they are presented, which means having ample opportunity to ask questions and to discuss. Assigned projects are also important for this type of student.

Many of the short courses need to be offered as seminars if they are to be effective. Provision is needed for all types of audio-visual aids, maps, charts and the like. Activities of the cultural program cannot be easily enumerated because they will vary widely and in some cases will be highly specialized. For this latter group of activities, it will be necessary to use specialized facilities. The same applies to the program of English as a second language, which will use the language laboratory extensively. Consideration should be given to offering some aspects of the cultural and advanced level courses by open circuit educational television.

Emerging Concepts and Developing Trends

Recent technological developments have greatly facilitated self-teaching and rapid feed-back on student achievement. One such rather well developed facility for such purposes is the language laboratory. Programmed instructional materials are being refined and improved. Considerable use is now being made of such materials in learning laboratories. Chapter VI, "Facilities for the Instructional Resources Center," describes the facility which is being recommended to utilize these developments. The community services program will make extensive use of that facility.

An emerging educational development is Computerized Assisted Instruction. It will be operational in the very near future. Essentially, CAI represents a sophisticated development of self-teaching and rapid feedback. The instructor is freed to give individual help and encouragement, while students proceed at their own rate of speed. CAI is a development which offers unlimited potential for the community services programs—especially the first two types of activities listed.

The general trend toward a shorter working day and week has important implications for the community services offerings. With more free time, adults in increasing numbers can be expected to pursue intellectual and cultural interests. In this connection, consideration should be given to extending this program to include Saturdays. One institution, Miami-Dade Junior College at Miami, Florida recently initiated such a program. Its success has exceeded all expectations.

Student Groups

Three of the programs will involve students on essentially a full-time basis; i.e., a five hour day. These are, namely, (1) the adult basic education program, (2) the adult high school diploma program and (3) the program of English as a second language. It is anticipated that there will be one group or class of 20 students served in the adult basic education program and two groups of classes of 25 students each for both the other two programs offered on campus during the daytime. Class sizes for these programs need to be kept small both because of the individual assistance that students in them need as well as to afford them a measure of security and identity.

The other programs, namely, (1) the short course program, (2) the cultural program, and (3) the program of advanced college courses will often involve participants for only one or two hours a week. Consequently, anticipated enrollments in Table 9.1 are shown as full-time equivalent students rather than attempt to estimate the actual number of individuals who will participate in these programs. The headcount will certainly be several times the FTE enrollments.

TABLE 9.1

COMPUTATION OF FTE FOR COMMUNITY SERVICES PROGRAM OFFERED DURING DAY ON CAMPUS[1]

Type of Program	Anticipated FTE Day Program Enrollment	Total Contact Hours Per Week	Contact Hours Per Day	Contact Hours Per Hour
Adult Basic Education (elementary level)	40	1,000	200	40
Adult High School Diploma	125	3,125	625	125
Short Courses	50	1,250	250	50
Cultural Program	50	1,250	250	50
English as a Second Language	30	750	150	30
Advanced College Courses	30	750	150	30
Total	325	8,125	1,625	325

---

[1] Room and student station utilization have been computed on a basis equal to the following: 85 per cent room period utilization; 80 per cent student station period utilization; an 8 period day; and a 5 day week.

Classes should be kept relatively small and conducted on an informal basis. For that reason the space guidelines presented in Table 9.2 are for seminar-type instructional spaces even though some of them are classified as "classrooms." There may be occasions when a large space will be needed. In these cases, an auditorium or lecture room can be used. Table 9.2 shows that limited special facilities are anticipated as needed for these community service day programs. It is assumed that the special facilities which are being planned for the other programs will be adequate for the limited need that the daytime community services programs will have for them.

TABLE 9.2

SUMMARY OF SPACE NEEDS FOR THE COMMUNITY SERVICES PROGRAM[1]

Types of Space	No. of Units	Area Per Unit (Sq. ft.)	Student Capacity Per Unit	Total Capa-city	Total Space Needs (Sq. Ft.)	Hours Per Day Needed for this Program
I. Instructional						
A. Special facilities						
1. Auditorium	1	(Space guidelines provided in another chapter)				1
2. Language lab	1	(Space guidelines provided in another chapter)				3
3. Art lab	1	(Space guidelines provided in another chapter)				4
4. Science lab	1	(Space guidelines provided in another chapter)				5
5. Computer lab	1	(Space guidelines provided in another chapter)				1
6. Music room	1	(Space guidelines provided in another chapter)				2
7. Occupational program labs	4	(Space guidelines provided in another chapter)				1 ea. lab.
B. Non-specialized facilities						
1. Seminar rms.	2	400	20	40	800	5
2. Classrooms	2	500	25	50	1,000	5
3. Classrooms	5	600	30	150	3,000	5

TABLE 9.2 (Cont'd)

SUMMARY OF SPACE NEEDS FOR THE COMMUNITY SERVICES PROGRAM[1]

Types of Space	No. of Units	Area Per Unit (Sq. ft.)	Student Capacity Per Unit	Total Capacity	Total Space Needs (Sq. Ft.)	Hours Per Day Needed for this Program
II. Auxiliary						
1. Conference rm.	1	200	—	—	200	—
2. Work room	1	120	—	—	120	—
3. Storage rm.	2	80	—	—	160	—
4. Faculty & Staff offices & related space		(See Table 9.2 for details)			2,180	—
Total	23			240	7,460	

---

[1] Student stations provided by specialized instructional facilities	—
Student stations provided by non-specialized instructional facilities	240
Total student stations provided by these facilities	240
Student stations for which space guidelines are provided in other chapters	85
Total FTE student stations required	325

Faculty and Staff

A full-time faculty and administrative staff of ten persons are needed for this program. Seven of these will be faculty. Of the remaining three, one will be the campus director for the program with the remaining two as assistant directors. The size of part-time faculty is difficult to predict since it will depend upon demand. A secretarial staff of four should be provided for the community services faculty and administrative staff.

To summarize, the faculty and staff for which office and work space need to be provided are as follows:

Program Director	1
Assistant Program Director	2
Full-time Faculty	7
Part-time Faculty	20 to 40
Secretaries	4

Table 9.3 shows the space requirements of this faculty and staff. The total space needed for these purposes will total 2,180 square feet.

TABLE 9.3

SPACE NEEDS FOR THE COMMUNITY SERVICES FACULTY AND STAFF

Types of Spaces	No. of Units	Area per Unit (sq. ft.)	Total Space Needs (sq. ft.)
1. Program Director	1	(c)	(c)
2. Assistant Directors	2	(c)	(c)
3. Faculty Offices	7	80	560
4. Part-time Faculty Offices	20[a]	40	800
5. Reception Area	1	120	120
6. Secretarial Office	1	100	200
7. Faculty Lounge Area	1[b]	500	500
Total	33		2,180

---

[a] It is anticipated that two part-time faculty members will share an office.

[b] It is recommended that this lounge area be combined with the lounge area for other faculty groups rather than be separate for the community services faculty.

[c] Space shown in Chapter on Administration.

The office space for part-time faculty requires special consideration. It is not practical to assign such instructors individual offices. Neither is it satisfactory to have them share offices with regular faculty members. Yet they need an area for making last-minute preparations for teaching and a place to store instructional materials and supplies and personal belongings such as coats.

To meet these requirements several arrangements should be considered. One is a general office area with screen partitions to provide partial privacy for individual desks. Another is to have double or triple offices divided with screen partitions. Least satisfactory is a large undivided and unscreened office area.

Furniture and Major Equipment

By virtue of the fact that these instructional facilities will serve diverse groups and instructional levels, it is important that the furnishings and equipment permit as much flexibility as possible. The following equipment and furnishings are recommended:

1. **Furniture**

   a. Tables and chairs for seminar rooms. By virtue of the fact that many of those enrolled will be well on in years, consideration should be given to purchasing cushioned chairs. Also, for maximum flexibility trapezoidal tables are recommended with both tables and chairs movable. Total: 120 cushioned chairs, 120 trapezoidal tables.

   b. Classrooms—teachers' tables and chairs. One table approximately 30 x 42 inches for each room and a cushioned chair. Total: 7 teachers' tables, 7 cushioned chairs.

   c. Full-time faculty office furniture. One lock desk, cushioned chair and file cabinet for each office. Total: 6 lock desks, 6 cushioned chairs, 6 lock file cabinets.

   d. Part-time faculty office furniture. One 30 x 42 inch table and a cushioned chair for twenty such faculty members with 5 file cabinets for the group. Total: 20 tables 30 x 42 inches, 20 cushioned chairs, 5 file cabinets.

Equipment

Each seminar and classroom should be equipped as follows:

a. Chalkboard: 12 linear feet

b. Tackboard: 6 to 8 linear feet

c. Clothes hanging rack: capacity 20 to 25 coats

d. Portable audio-visual equipment stand: approximately 30 x 24 inches

e. Retractable visual screen

f. Map rails and hangers

Recommended Space Guidelines

As has been previously noted, those enrolled in the community services program will represent such a variety of interests and needs that they will draw upon many of the College's facilities. This will be true also for those who participate in these day programs. At the same time, as has been mentioned, their numbers are sufficiently small that additional specialized facilities are not proposed to accommodate them.

Table 9.2 shows the additional instructional space which is recommended for the day portion of the community service programs. By way of summary, this space is as follows:

2 seminar rooms (capacity 20)	40 student stations
2 classrooms (capacity 25)	50 student stations
5 classrooms (capacity 30)	150 student stations
Total	240 student stations

It is highly important that the instructional facilities which are planned for the community service programs be aesthetically appealing. An attractive environment is very much needed by these students, especially those in the adult basic education and adult high school diploma programs.

Students who enroll in the other community service programs will include many who possess aesthetic interests which they wish to develop. It is from this group that support for the College and its programs must come. Their impressions, growing out of their experiences as students, will in large measure determine their attitude toward the College. Its emotional impact upon them should not be underestimated. Every possible effort should be made to plan instructional facilities for this group which creates in them a sense of excitement and security.

Following are special features recommended for each of these seminar rooms. Some of them are included primarily because of their contribution to the type of climate discussed in the preceding paragraph.

1. Carpeted floors
2. Aesthetically appealing wall and floor colors
3. Window draperies
4. Attractive color designs that are varied from room to room
5. Wall storage cabinets
6. Built-in sink and counter space for three of the rooms
7. Room controlled heating and ventilation
8. Recessed picture mold
9. Sound and light control
10. Adequate artificial lighting

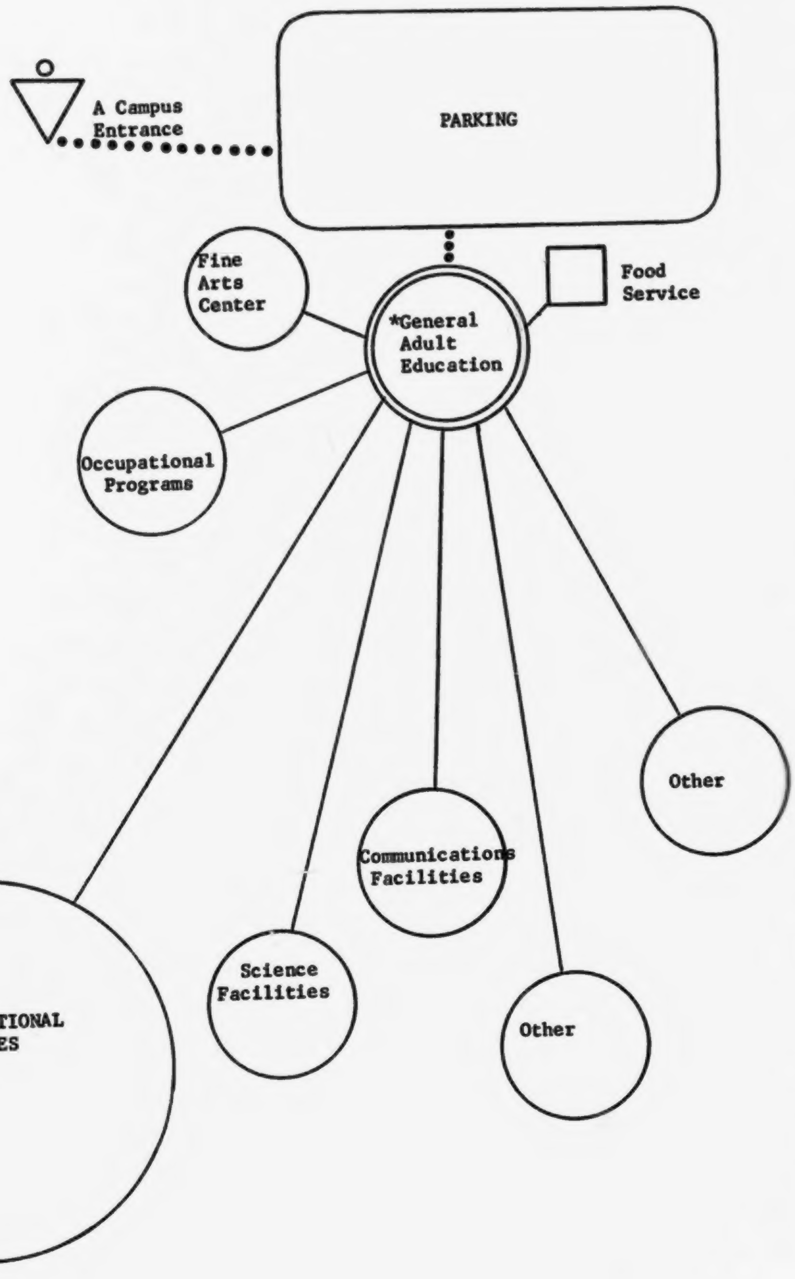
Description of Functional Relationships

Figure 9.1 shows the functional relationships of the community services facilities to other facilities on the campus which will be utilized by these programs. The following comments are offered in the way of explanation and elaboration.

1. It is important that instructional facilities for the adult basic education program and to the extent possible, those for the adult high school diploma program, be located near a campus entrance and parking area. Adequate parking is needed at this location (approximately 350 cars) for these students.
2. Those enrolled in the adult high school diploma program will take courses which require the use of specialized facilities, developed primarily for other programs. Obviously, it is not possible to have all such facilities located in close proximity to where their basic courses are taken. However, to the extent possible, the general adult education facilities should be in reasonably close proximity to (a) the learning resources center, (b) the science laboratories, (c) the fine arts center and (d) the secretarial science and shop facilities.
3. A considerable number of those who participate in the evening programs come directly from their place of employment to the campus. It is important that there be a food service available to

FIGURE 9.1

RELATIONSHIP OF COMMUNITY SERVICES FACILITIES TO OTHER CAMPUS FACILITIES


A Campus Entrance
PARKING
Fine Arts Center
*General Adult Education
Food Service
Occupational Programs
Other
Communications Facilities
Science Facilities
Other
INSTRUCTIONAL RESOURCES CENTER

*The facilities specifically planned for this program. See Table 9.1

them within reasonable distance of where their classes are held. The student center is the logical place to provide this service.

4. The office for the campus director of community services and his secretary should be located with the main campus administrative offices. However, the two assistant directors should be located near their faculties.
5. Faculty offices should be concentrated and in close proximity of their classrooms and of the secretarial offices.
6. If possible, three faculty offices should open upon each of the two seminar rooms.
7. The offices of faculty who work in this program should be located near the offices of faculty members who work in other programs of the College.

X

FACILITIES FOR PHYSICAL EDUCATION

Philosophy and Objectives

The physical education program has two major objectives. One is to develop interests and competencies which will result in life-long physical activity. The second is to develop and maintain good body conditioning on the part of the college student along with health education.

Whenever possible the program should be conducted on a coeducational basis and should serve students from all programs of the College including those in community services and occupational programs. Also, if the first objective is to be attained, it is essential that the program be organized and operated so that student participation will be voluntary. Every effort must be exercised to avoid developing negative attitudes toward participation in physical activity. Rather, the program should be made so attractive that students will want to take part. Requiring participation too often creates a condition whereby students avoid physical activity when it is no longer required.

The administration has taken the position that each campus of the Seattle Community College will develop its own curriculum and that the intercollegiate sports program should emerge progressively on each campus as it is developed. Consequently, the space and facilities proposed here are those needed for a good instructional and intramural physical education curriculum. These facilities should make possible the subsequent development of a sound intercollegiate athletic program.

The Curriculum

Attaining the objectives of the program calls for a wide range of activities. Also, because of climatic conditions, the program is rather heavily oriented toward indoor activities. The following list includes anticipated activities which can be offered by means of regularly scheduled classes, the extracurricular program, unorganized activities and the intercollegiate sports program.

Group I: **Individual Competitive Activities**

1. Archery
2. Badminton
3. Bowling[1]
4. Fencing
5. Golf[1]
6. Hardball

---

[1] These activities will be conducted off campus.

7. Horseshoes
8. Paddleball
9. Squash
10. Table tennis
11. Tennis
12. Track

Group II: **Aquatics**

1. Boating[1]
2. Diving
3. Rowing[1]
4. Sailing[1]
5. Swimming
6. Water skiing[1]

Group III: **Body Development and Conditioning**

1. Calisthenics
2. Dance forms
3. Gymnastics
4. Tumbling
5. Weight training
6. Wrestling
7. Self-defense

Group IV: **Outdoor Recreation**

1. Camping
2. Hiking
3. Ice skating
4. Mountain climbing
5. Snow skiing

Group V: **Team Sports** (Intra-mural)

1. Baseball
2. Basketball
3. Football
4. Soccer
5. Softball
6. Volleyball

Group VI: **Health and Safety**

1. Corrective and remedial activities
2. First aid
3. Health education
4. Life saving

Teaching and Learning Activities

Teacher activities will emphasize explanation, demonstration and supervision. Substantial use will be made of audio-visual aids, and in certain activities, considerable time will be devoted to lecture and discussion.

Student involvement, quite understandably, will focus on participation in physical activity. However, they will also observe demonstrations, view audio-visual aids, participate in discussion, listen to explanations and lectures and prepare reports and notebooks.

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[1] These activities will be conducted off campus.

Emerging Concepts and Developing Trends

Changes which are occurring in our society point up the importance of physical education. Reference has been made to one of these; namely, that it is important for youth and adults to develop a favorable attitude toward participation in physical activity. With increased free time and early retirement, it is important that people spend a portion of this time in physical activity. Further, people are increasingly engaged in types of employment which require little or no physical activity. It is important for reasons of health that they develop interest and competency in sports.

This situation calls not only for a program with appeal but also for facilities designed in such a way that they create a favorable image of physical activity and will cause those who see the facilities to want to use them. Too often in the past, such appeal appears to have received little consideration in the planning of these facilities.

Recent developments in the use of instructional aids has nearly as much significance for teaching physical education as they have for academic courses. It is important that this facility be planned so that effective use can be made of such aids.

Student Groups

A study of four well developed community colleges revealed that 10 per cent of the total contact hours taken by students were in physical education.[2] On this basis, 240 student stations would be required for the program. However, since most physical education courses are activity courses, they require two hours of class attendance for one credit hour. Therefore, the required student stations will exceed considerably 240. As has been mentioned, due to inclement weather, indoor facilities are needed to accommodate the program. In light of this fact, guidelines are proposed for approximately 300 student stations indoors. This number includes those enrolled in health education courses.

The majority of instructional groups will range from 20 to 40 students. On occasion, it will be desirable to teach groups ranging up to 100 in size. Usually, however, such groups will be organized for the purpose of bringing several class sections together to hear a lecture, view an audio-visual presentation, observe a demonstration, participate in mass physical conditioning activities. Groups smaller than 20 will be required for activities such as handball, squash, diving and water skiing.

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[2] *Long Range Planning for Seattle Community College,* The Associated Consultants in Education, Inc., Tallahassee, Florida (1966).

The philosophy of the program, previously stated, means that students will be drawn from all programs offered by the college. This means that they will represent a wide range in age, interests, skills and endurance.

Faculty and Staff

A full-time physical education faculty of 12 is projected as needed to carry out the program which has been proposed. This figure was arrived at by using an assumed FTE physical education enrollment of 300 and a student-faculty ratio of 20:1. In addition, four part-time faculty are anticipated as needed for the community services program. Two of these part-time faculty members can share an office. Two secretaries will be needed for this faculty. In summary, office and work space will be needed for the following:

Division Head	1
Full-time faculty	11
Part-time faculty	4
Secretaries	2

Table 10.1 gives the space requirements for these offices and work area.

TABLE 10.1

SPACE NEEDS FOR THE PHYSICAL EDUCATION FACULTY AND SECRETARIAL STAFF

Types of Spaces	Number of Units	Area per Unit (sq. ft.)	Total Space Needs (sq. ft.)
Administrative Office	1	150	150
Reception Area	1	120	120
Secretarial Offices	1	80	80
Work Room	1	200	200
Faculty Offices (full-time)	11	80	880
Part-time Faculty Offices	4	20	80
Faculty Lounge	1	500	500
Total	20		2,010

Major Equipment and Furnishings

	No. of Units
I. Office Furnishings	
Faculty desks	12
Desk chairs	14
Work tables for part-time faculty offices	2
Secretary desks	2
Secretary chairs	2
II. General Classrooms	
Student chairs	60
Student tables to seat 60 students	60
Instructors' table and chair	2
A. **Gymnasium**	
Portable chalkboard	1
Set of risers for orchestra (etc.)	1
Drop net for gym divider	1
Retractable bleachers	500-800 seats
Volleyball nets	3
Badminton nets	6
Removable standards—volleyball	3 sets
Removable standards—badminton	6 sets
Basketball backboards and goals	3 sets
Amplified sound systems	1
Electrical clock and scoreboard	1
Folding chairs	50
Dolly for volleyball and badminton standards	1
B. **Natatorium**	
Starting blocks	8 sets
Diving boards (one meter)	2
Diving board (three meters)	1
Lifeguard and instructor's stand (collapsible)	2
Retractable bleachers	100 seat capacity
Pool dividers	4
C. **Dance and Remedial Rooms**	
Piano (on rollers)	1
Wall mirrors	15-20 linear feet

	No. of Units	
Floor mats	6	
Collapsible chair desks	40	
Portable mat dolly	1	
Table for record player	3	(one for each room)
Instructors' desk and chair	3	(one for each room)
Heat lamps	3	(one for each room)
Portable mat dolly	1	

D. Training Room

Whirlpool bath	2	
Treatment tables	4	
Heat lamp	2	

E. Body Development and Conditioning Room

Balance beam	2	
Climbing ropes	4	
Chest bars	2	sets
Parallel bars	2	sets
Rowing machines	3	
Stationary bicycles	3	
High bars	3	
Flying ring	2	sets
Side horse	1	
Horizontal ladder	1	
Wall bars	2	sets
Bucks	1	
Floor mats	12	
Portable mat dolly	2	
Trampoline	1	
Springboard	1	
Barbell weights	6	sets
Wall weights	3	sets

IV. Auxiliary Areas

Hair driers—including units (women's dressing room)	12	
Storage basket (students' P.E. equipment)	1,800	(1,200 men's 600 women's)
Lockers (full-length)	300	(200 men's 100 women's)

Faculty lockers (full-length)	35 (25 men's 10 women's)
Full-length lockers for students athletes	50
Full-length lockers for visiting athletes with baskets	30

Special Environmental Considerations and Utilities Requirements

Following are requirements which need to be met when planning the physical education facilities.

1. All indoor space used for instructional purposes, along with dressing, basket and drying areas should be mechanically ventilated.
2. A built-in communication system to all indoor and outdoor instructional areas should be provided. A portion of the system serving the natatorium, gymnasium and outdoor track and field should be so constructed that it can be used both for instructional purposes and to announce sports contests.
3. Windows of indoor instructional areas should be located so as to avoid glare during class periods.
4. All rooms used for lectures and general instruction should have conduits for educational television and pull-down screens for visual projections.
5. All indoor instructional rooms need to have wall electrical outlets for audio-visual aids. Electrical outlets are needed elsewhere throughout the indoor area for electrically operated cleaning equipment.
6. The floor surfaces of all areas should be of material which can be efficiently cleaned.
7. Each classroom should be equipped with at least twelve linear feet of tackboard space. In addition, at least twelve linear feet of chalkboard space, probably in two sections, should be provided just inside the main entrance. At least twelve linear feet in two sections are needed in the gymnasium.
8. One or more display cases should be provided just inside the main entrance to the building. Two glass covered "Official Notice" cases

each approximately 2′ x 2′ are needed near the entrance to the gymnasium.

9. The indoor space should be arranged so that the dressing and shower facilities are accessible from the exercise areas.

Recommended Space Guidelines

Table 10.2 shows the number, type and approximate space needed for the physical education program. Square footage requirements are computed only for the indoor space.

It is also anticipated that the College will utilize both indoor and outdoor facilities which exist elsewhere in the community. Such facilities will be needed for golf, bowling, outdoor water activities and outdoor recreational activities. It appears impractical for the College to construct and operate facilities for these activities at the present time. In each instance such facilities exist nearby.

Gymnasium (100′ x 120′ = 12,000 sq. ft.)

This facility will provide instructional space for between 40 and 100 students as follows:

1. A regulation size basketball court 50′ x 94′ located in the center of the area with a minimum safety zone of 10′ at each end.
2. Two basketball cross courts; 42′ x 84′ each.
3. Three volleyball courts; 30′ x 60′ each.
4. Six badminton courts; 20′ x 44′ each.
5. An indoor running and calisthenics area.

Basketball backboards should be located 4′ from end lines. Backboards for the main court and those for the side of the bleacher should be retractable, preferably electrically. A ceiling height of 25′ is needed throughout. Retractable bleachers to seat between 500 and 800 spectators should be installed along one sidewall. They should extend outward and may open to within 6′ of the main basketball court.

Sufficient glare-free artificial lighting should be provided to eliminate shadows. Windows, if used, should be located not less than 10′ from the floor.

The walls of this facility should be kept free of projections e.g., hooks on which to hang equipment and the like. A storage room approximately

TABLE 10.2

SUMMARY OF ESTIMATED SPACE REQUIREMENTS FOR THE PHYSICAL EDUCATION PROGRAM

Types of Space	No. of Units	Area per Unit (sq. ft.)	Student Capacity per Unit	Total Capacity	Total Space (sq. ft.)	Hours per day Needed for Program
I. Instructional						
A. Special Facilities						
1. Gymnasium	1	12,000	40	40	12,000	7
2. Natatorium	1	9,100	40	40	9,100	7
3. Dance & remedial rm.	1	1,500	25	25	1,500	5
4. Body development rms.	1 (+1 faculty)	1,200	25	25	2,400	6
5. Handball courts	2 (+1 faculty)	800	4	8	2,400	7
B. Non-specialized Facilities						
1. Classrooms	2	600	30	60	1,200	7
II. Auxiliary						
A. Mens' dressing & shower area (includes visiting team)	2	—	140 (in showers)	(140)	2,500	
B. Womens' Dressing & shower area	1	—	60 (in showers)	(60)	1,200	

TABLE 10.2 (Cont'd)

SUMMARY OF ESTIMATED SPACE REQUIREMENTS FOR THE PHYSICAL EDUCATION PROGRAM

Types of Space	No. of Units	Area per Unit (sq. ft.)	Student Capacity per Unit	Total Capacity	Total Space (sq. ft.)	Hours per day Needed for Program
II. Auxiliary (Cont'd)						
C. Faculty mens' dressing & shower room	1	900	80 (in showers)	(80)	500	
D. Faculty Womens' dressing & shower area	1	350	5 (in showers)	(5)	250	
E. Lounge	1	900			900	
F. Drying Room	2	300			600	
G. Equipment Storage (indoor)	4	500			2,000	
H. Equipment Storage (outdoor)	2	500			1,000	
I. Public Toilets	2	250			500	
Total I and II	24				38,050	
III. Space Needs for Faculty and Secretarial Services	20	See Table 10.1			2,010	
Totals	44			198	40,060	

8′ x 10′ should open onto the gymnasium. It is needed to store badminton and volleyball standards and nets, scoring equipment, folding chairs and the like. The doors should be of sufficient size to permit moving volleyball standards, a piano, risers and the like in and out.

Consideration should be given to the installation of colored floorboards to provide, in part, markers for various courts. It is important that floor plates be installed for securing volleyball and badminton standards. To the extent possible, this facility should be planned so that it can serve as a meeting place for large groups at social and formal college functions. Pieces of equipment which facilitate the use of this facility for such purposes include the following: dimming lighting system in installed system, an amplified system, portable risers and sound control.

Natatorium (9,100 sq. ft.)

The pool should be 83 feet (25 meters) long and approximately 65 feet wide. This will permit 9 lanes of regulation 7 foot width. The deck around the pool should be at least 7 feet wide on all sides with a width on one side of approximately 20 feet. The wide side will provide an area for "land" instruction, the instructor and lifeguard stands, retractable bleachers to seat approximately 100 and a storage area.

The pool should be a depth of 3′6″ for a distance of approximately 10 to 15 feet from one end. It should then slope downward to a depth of 8 feet to where it approaches the diving area. This will allow for diving from the edges of the pool and for aquatic performance. The diving portion of the pool should be confined to roughly one-half of the pool width, or about 30 feet, leaving the remaining width unobstructed for swimming. The diving portion of the pool should be 15 feet throughout.

Two one-meter and one three-meter diving boards are recommended. The three-meter board should be located between the other two. No board should be closer than 8 feet to the side of the pool, and the boards need to be 10 feet apart. Twelve feet of unobstructed space is needed above each diving board. Intercollegiate regulations require that boards used for competitive purposes be constructed of wood. They need to be covered the entire length with cocoa matting or other non-slip finish which is easily removable.

A lane line marker 10 inches wide for each lane is needed on the bottom of the pool. These markers should be in the center of the lane and begin 4 feet from each end. Lane and all other pool markings should be set in tile.

A storage area accessible only from within the natatorium for safety is needed to store such items as pool dividers, starting blocks, instructor and lifeguard standards, chairs and the like. An amplified sound system and a spot lighting system should be provided. Consideration should also be given to the installation of these two items of equipment under water.

It is suggested that a portion of the natatorium be enclosed with transparent glass so that the pool can be seen from outside. This would constitute another effective means of enticing students to participate in the physical education program.

Provisions are needed for humidity and sound control.

Combination Rooms for Dance and Remedial Programs

These rooms will serve approximately 25 students per class period. In addition to providing facilities for the dance and remedial programs, they will be convertible to general classrooms. For this latter purpose, they will need to be equipped with collapsible chair desks which can be stored in an adjoining storage room when the classroom is used for physical activity. Adjustable wall bars should be installed along two walls. One wall should contain several full-length mirrors with protective door covers. Windows, if provided, need to be approximately 8 feet above the floor to preserve wall space for the above mentioned equipment. Since these rooms will be used extensively during the daytime, they should be located so as to obtain a maximum amount of natural lighting.

Storage space is needed for at least one piano, three phonographs, records and rhythm instruments. With careful planning, one such storage area with door openings sufficiently large for a piano can serve all three rooms. A portion of the space allocated to each room could be used for an area approximately 14′ x 20′ in which the whirlpool baths, training tables and a sink are located. This area should open onto at least two of the rooms and also be accessible from a hallway which will permit using it for an athletic training room. It should be provided with lock cabinets for towels and sheets. An alternative is to locate these facilities in the dressing area for the shower facility. In this case, separate facilities will be needed for men and women.

At least one portable dolly is needed to hang and store floor mats. This dolly can be stored with the piano and other equipment and moved wherever the mats are to be used. The common practice of hanging mats on wall hooks is unsatisfactory for several reasons. First, students are inevitably removing them without permission. Second, they impair the attractiveness of the area. Third, they are usually dragged to and from their hanging location which wears them out and gets them dirty. With a portable dolly, mats can be transported directly to where they are to be used. Furthermore, fewer mats will be required to satisfactorily equip the three rooms.

Body Development and Conditioning Rooms

This room should be planned to serve several specialized purposes. This room will serve approximately 25 students per class period.

The room should provide space for all of the gymnastics equipment, consisting of balance beams, climbing ropes, chest bars, parrallel bars, rowing machines, stationary bicycles, high bars, flying rings, side horses, wall bars, horizontal ladders and bucks. Floor plates for attaching equipment should be built in. The location of the flying rings should allow at least 15′ at the end of the swinging arc. The portion of the area in which the high bar and high rings are located needs a minimum ceiling height of 18 feet.

It is essential that this room have a rather large adjoining storage room. This permits a smaller room which is still adequate in size, since equipment which is not being used can be removed. Further, it reduces the chance of injury by students attempting to show off on idle equipment. A single storage area properly located can serve all three rooms. If possible, this storage room should also open onto the gymnasium so that the gymnastic equipment can be used there for public performances. Large doors are needed for this storage room. These doors should be sliding rather than hinged type to reduce the danger of injuries to performers.

Another function of this room should be for tumbling, and it should be equipped with spring boards, a trampoline and floor mats. A portable mat dolly is needed for transporting these floor mats to and from the storage room. The storage room should be large enough to store a trampoline. It is important that this piece of equipment be stored when not in use, or injuries will result from its unauthorized use. Further, by storing it and other equipment, the area can be used for other purposes.

The third function should be a weight lifting and wrestling room. It needs to be equipped with mats sufficient to cover the entire floor. Portable mat dollies are needed to store these mats.

The ceiling height should be ten to twelve feet except in the high ring and high bar area where more height is required. Window sills should start approximately 8 feet above the floor and, if possible, should extend the length of at least one wall. Glare reducing glass should be used if the direct rays of the sun strike the window area.

Handball Courts

These courts when used for handball or squash will provide facilities for 8 students at a time. When used for other purposes, each court can accommodate up to 20 students for a total of 40. It is important that these courts be of official A.A.U. dimensions for four-wall handball which are 20′ wide, 40′ long and 20′ high.

The entire interior surface should be smooth. Lights need to be recessed and covered by unbreakable glass. Light switches should be located outside of the court. Doors should be of heavy wooden construction so that the bounce of the ball from them will not differ from that of surrounding walls. However, it is recommended that the doors be at least of normal size to facilitate using the space for other purposes including moving a floor mat dolly in and out.

Each court should have available adequate electrical outlets. These are needed for cleaning equipment and for teaching aids. A drinking fountain should be located just outside of the courts. It is proposed that a spectator and coaching balcony be constructed across the back of these courts. The opening should be covered with heavy mesh and/or glass and located above the out-of-play line on the back wall.

Floors should be of hardwood and in natural color. Walls may be of wood or masonry, but not plaster which tends to crack and crumble. Ceilings may be either of a hard plaster or wood. Walls and ceilings should be painted a matte white or buff color.

Dressing and Shower Areas

Dressing and shower facilities for both men and women need to be planned either so at least a part of them can be made available for swimming while locked off from the remainder of the indoor physical education facilities or as completely separate for swimming. The first arrangement requires that the dressing rooms can be entered from three different points: (1) the outside, (2) the natatorium and (3) the other indoor physical education facilities. The specifications which follow are based on the assumption that a maximum of 200 students will be dressing and showering at one time. As previously noted, the anticipated ratio of men to women is two to one. Further, a somewhat higher proportion of men than women who are engaged in physical activity take showers. Therefore, the shower specifications which follow are planned to serve 140 men and 60 women at peak load. The dressing areas need to provide space for approximately twice this number because of class changes which bring two groups to the area at one time.

These facilities should have the following features:

1. Shower and drying area drain toward the sides instead of the center. Drains need to be adequate to carry away water during peak loads.
2. Shower heads of the ball and socket type and mounted approximately 6 feet from the floor—slightly lower for women.
3. Liquid soap dispensers. These should be interconnected to permit filling at one point.
4. Dressing mirrors with several full length ones in the women's dressing area.
5. At least two drinking fountains in the men's dressing area and one in the women's.
6. Floor surfaces of material that is easy to clean; will not crack, chip or scratch from cleats; will not absorb moisture; and is nonskid for bare feet.
7. A convenient place to hang or place towels while using gang showers.
8. Both dressing areas need shelves on which to place books and purses for women while grooming hair.

A basically different shower arrangement for men than for women is recommended. Gang showers are proposed for men, whereas for women it is recommended that all of the area be devoted to individual dressing and shower cubicles. These cubicles should have a dressing area of about 3′ x 3′ and should be equipped with a built-in bench and non-corrosive clothes hooks. These dressing and shower compartments should be separated by curtains or a permanent partition. Each shower compartment must have its own drain. Hair drying equipment in the women's dressing room is essential because of the swimming pool. At least six hair dryers are needed. These can be either a group-type installed in the wall or individual units. In either case, they should be placed at sitting height with permanently installed benches for their use.

The "open rack" method of clothes and equipment storage is recommended. This method works as follows:

1. Each student is issued a basket at the beginning of the year containing a towel and whatever athletic costume the College chooses to provide. The basket is numbered and equipped with a combination lock. This basket, with the equipment which has been provided, is stored in a permanent basket rack which contains the same number as the basket.
2. When the student enters the dressing room he gets the basket and proceeds to a half-length dressing locker. After changing into sports clothing, his street clothes and the basket are stored in the locker.
3. Upon returning from physical education he showers, dresses and exchanges his soiled towel (and other clothing if this service is provided). He then places his equipment in his basket and locks the basket where it remains until he returns.

With this arrangement, the anticipated men's physical education enrollment can be adequately served with 200 half-length lockers and twenty-five full-length lockers for varsity athletes. The women can be adequately served with 100 half-length lockers. Calculating the number of storage baskets needed is difficult. Not every student will participate in physical education each term and of those who do, a considerable number will not need to shower because of the type of activity in which they engage. Further, many students—especially those who are part-time—can be expected to carry their equipment with them. Because of these facors, it seems that 1,200 storage baskets will be adequate for the men and 600 for the women.

Temperature controls should permit increasing the temperature of the dressing area when large numbers of swimmers are using that facility.

Faculty Dressing and Shower Rooms (35 men, 10 women)

Dressing and shower facilities are needed for physical education; one for the men and one for the women. It is recommended that these facilities be expanded somewhat beyond what is needed for this purpose to provide dressing and shower facilities for all of the faculty. This will encourage them to utilize the physical education facilities and thus provide one more means of promoting student participation. In addition, by expanding the faculty men's facility slightly more, it will provide a dressing room for visiting athletic teams. The space which has been recommended is adequate for this purpose. The men's area should have 25 full-length lockers and 8 shower heads; the women's area should have 10 lockers and 5 individual shower and dressing stalls.

These dressing and shower rooms should afford easy access to both indoor and outdoor activity areas and be in close proximity to offices of the physical education faculty.

Laundry and Drying Room
(500 sq. ft.)

Space and utilities should be included in this area for at least three automatic washers and two dryers if the College is to provide towel service. Additional laundry equipment will be required if athletic clothing is to be washed. There are companies which lease and service automatic washers and dryers for educational institutions. If laundry is sent out, this area will still be needed for storage of soiled and clean supplies as well as for a drying room. (What is the most satisfactory and economical way to handle laundry is a matter which should be investigated further.)

This room should have a work counter at least 10′ in length, 30″ wide and 3′ above the floor. Storage shelves can be installed under this counter. In addition it should be equipped with portable bins for soiled towels and such other items as may be laundered.

It is recommended that racks for hanging uniforms be suspended from the ceiling. The hangers should be of sturdy non-corrodible material. Whatever wall area of this room is not required for drying uniforms, laundry equipment and storage of laundered items should be utilized for equipment storage. If items sold to students are stored, the shelves or cabinets should be equipped with locks.

This facility needs to be located in close proximity to the dressing check-out cage. Provision must also be made either here or in the storage basket area for the quick drying of bathing suits.

Indoor Equipment
(2,000 sq. ft.)

At least four such rooms are needed. As already noted, one is needed for the three gymnastics rooms, one for the three rooms proposed for the dance and remedial programs and one for the gymnasium. Another is needed to store athletic equipment. This room should be adjacent to the equipment check-out room in the dressing area and directly accessible from it so that all equipment can be issued from a central location.

Lounge (900 square feet)

As another means of getting students to identify with the physical education program, it is recommended that a small attractive lounge be provided convenient to the gymnasium. Consideration should be given to the inclusion of a coffee bar in this lounge. If this is not done, it should be equipped with a mechanical coffee and soft drink dispenser.

Outdoor Facilities

Archery Range (50 yds. x 123 yds.)

A target archery range consisting of 10 targets is recommended. Targets should be placed between 12 and 15 feet apart. An unobstructed distance of 125 yards is required which includes 25 yards behind the targets. The area behind the targets must be fenced off from pedestrians and should have a raised area or bank approximately 25 yards behind the targets.

Athletic Fields (110 yds. x 250 yds.)

These two fields will serve multiple uses. Three softball fields or two softball and one baseball fields and backstops can be laid out on this area. In addition, it will serve as an area for two football, one soccer, two field hockey or two speedball fields. Official dimensions for each of these fields are as follows:

1. Football	160′ x 360′
2. Soccer	225′ x 360′
3. Speedball	160′ x 300′
4. Field Hockey	150′ x 270′

In addition, this area can be used to teach golf fundamentals as well as for group calisthenics and running. A grass turf covering should be provided.

Tennis Courts (144 yards x 160 yards)

Eight official size double courts should be provided. The dimensions for each court are 36 feet x 78 feet. Allowing for side and end space, each pair of double courts will require 108 feet x 120 feet. It is also possible to use this area for badminton and volleyball, which will require portable standards that can be stored nearby. Fittings for their installation should be provided at the time of construction.

An all-weather surface is needed for these courts. Recently, several new and excellent surfaces have been developed. The relative merits of these should be analyzed.

Handball Courts (40′ x 200′)

Three outdoor handball courts are recommended. These should be either one-wall or three-wall courts. The three-wall game is becoming increasingly popular. Recommended measurements for three-wall courts are 20 feet wide, 40 feet long with the wall 20 feet high. The side walls extend back 24 feet and angle down to a height 12 feet where they end. A retaining wall is needed 10 feet back of the end line.

The standard dimensions of a one-wall court are 20 feet wide, 34 feet long and an end wall 16 feet high. An area 5 feet to 8 feet is needed between one-wall courts (but not three-wall courts) and 10 feet beyond the back line. Consequently, both types of courts require approximately the same area.

Floor areas should be of smooth concrete construction and the walls either concrete or smooth reinforced cement block.

Outdoor Basketball-Volleyball-Tennis
Practice Area (45′ x 200′)

To obtain this area the back side of the handball wall should be surfaced with smooth concrete for a depth of 40 to 45 feet and the full length of the wall; i.e., approximately 200 feet. This area will provide for the following:

1. Four basketball goals (projecting 6′ from the handball wall)
2. Eight badminton courts
3. Three volleyball courts
4. Practice space for six to eight tennis players

Fittings should be included at the time of construction for installing volleyball and badminton standards.

Horseshoe Courts (60′ x 96)

Six horseshoe courts should be provided. Each court requires an area of 6 feet x 46 feet. With the required safety areas, the minimum dimensions for each court are 16 feet x 60 feet.

Track

A 440-yard oval track running around one of the athletic fields is recommended. One side should be extended so as to have a 130-yard straight-away. There should be six lanes of 42 inches each on the oval with eight lanes for the 130-yard straight-away. This means an overall width of 21 feet for the oval and 27 feet, 11 inches for the straight-away.

The broad jump and the pole vault runways should each be at least 130 feet long and 4 feet wide. The high jump area should form an arc with a 60 foot radius to a jumping pit which is at least 12 feet long and 16 feet wide. The running track needs a surface of from 4 to 6 inches in depth composed of a mixture of clay or loam and with finely ground cinders, crushed shell or brick, pumice, perlite or similar material. Portable bleachers to seat 500 should be provided.

Climbing Rock

If possible, a rock (natural or artificial) should be located in the physical education area to be used for instruction in mountain climbing. This rock should be 12 to 15 feet high and approximately 20 feet in diameter at the base.

Equipment Storage Area (1,000 sq. ft.)

Two storage sheds need to be located at strategic sites on the outdoor physical education area. They should have concrete floors, wide sliding doors with as much height as possible. These two buildings should provide approximately 1,000 square feet of storage area.

Functional Relationships

To the extent possible, the following guidelines on location of the physical education facilities should be followed:

1. These facilities should be located near the Student Center. This is especially important for the indoor facilities, since the more convenient these facilities are the more they will be utilized voluntarily by students.
2. The gymnastics, tumbling and wrestling rooms should connect with one another. In addition, the gymnastics room should open onto the gymnasium.

3. A single equipment check-out room has been recommended. It is essential that this room be located where both men and women have easy access to it from their dressing and shower areas.
4. For safety and health reasons the only accesses to the natatorium should be through the dressing and shower rooms since it is anticipated the swimming facility will be made available to the general public. Therefore, access to these dressing facilities needs to be from a corridor that leads directly outside so that at these times the general public can be excluded from other indoor facilities. This arrangement is also needed so that students using the outdoor facilities can go directly to the dressing and shower areas.
5. Consideration should be given to locating the College nurse's quarters in the physical education area. This program has more need for her services than any other single program of the College.
6. The outdoor physical education area should, if possible, be located so that students do not have to cross busy streets to get to it.

Figure 10.1 shows the proposed relationship of the physical education facilities to other campus facilities. Figure 10.2 diagrams the proposed relationships of indoor facilities and Figure 10.3 does the same for outdoor facilities.

FIGURE 10.1

GENERAL RELATIONSHIPS OF PHYSICAL EDUCATION FACILITIES TO OTHER FACILITIES

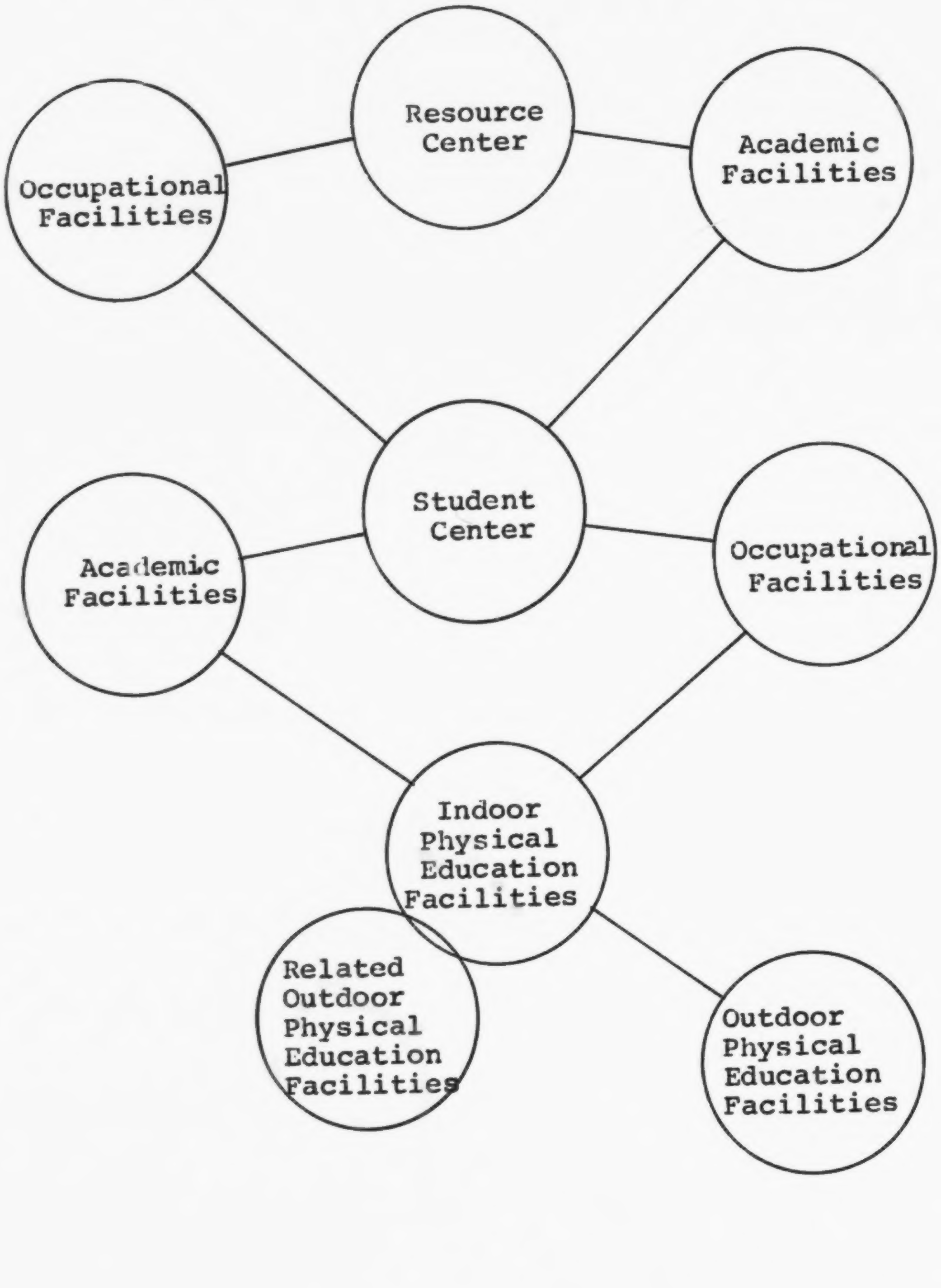

Resource Center
Occupational Facilities
Academic Facilities
Student Center
Academic Facilities
Occupational Facilities
Indoor Physical Education Facilities
Related Outdoor Physical Education Facilities
Outdoor Physical Education Facilities

FIGURE 10.2

RELATIONSHIPS AMONG INDOOR PHYSICAL EDUCATION FACILITIES

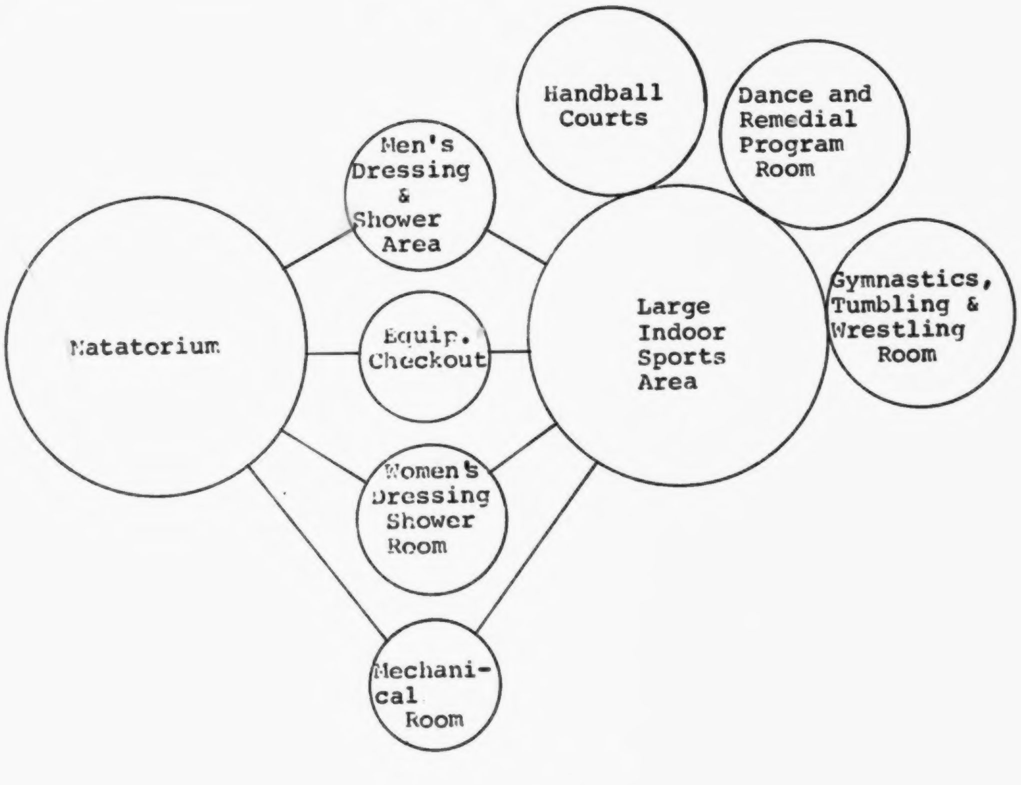
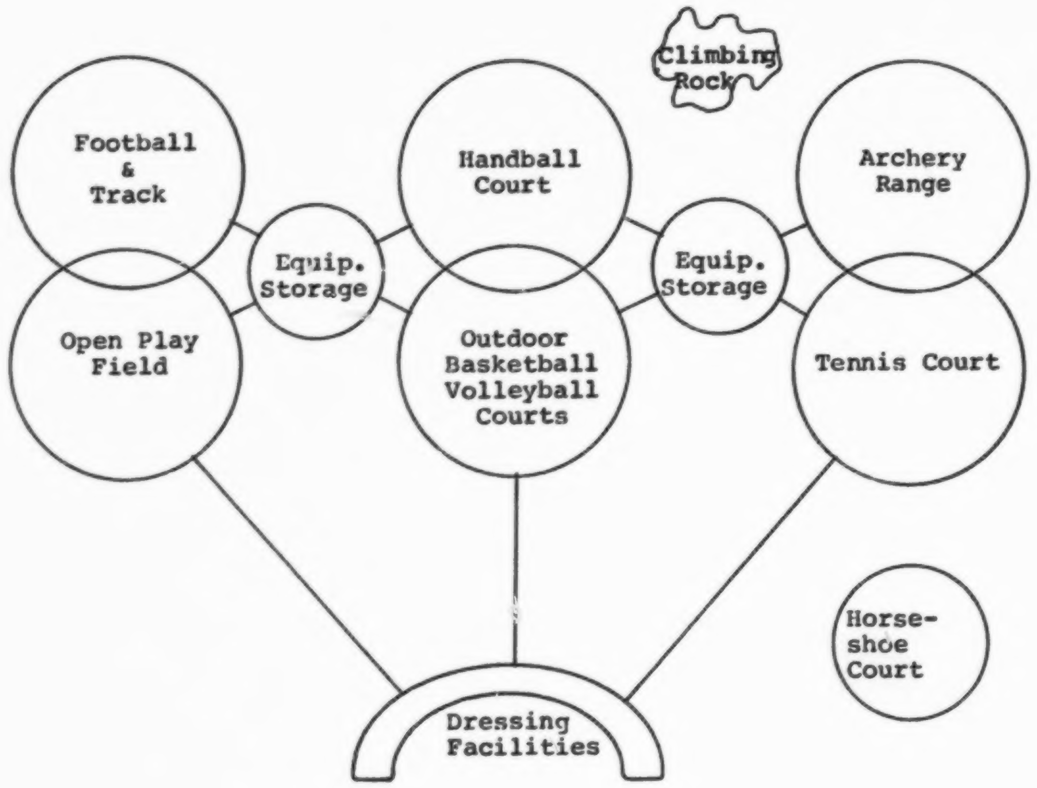

Handball Courts
Dance and Remedial Program Room
Men's Dressing & Shower Area
Natatorium
Equip. Checkout
Large Indoor Sports Area
Gymnastics, Tumbling & Wrestling Room
Women's Dressing Shower Room
Mechanical Room

FIGURE 10.3
RELATIONSHIPS AMONG OUTDOOR PHYSICAL EDUCATION FACILITIES


Climbing Rock
Football & Track
Handball Court
Archery Range
Equip. Storage
Equip. Storage
Open Play Field
Outdoor Basketball Volleyball Courts
Tennis Court
Horse-shoe Court
Dressing Facilities

XI

THE AUDITORIUM FOR THE PERFORMING ARTS

The auditorium is planned for joint usage by drama and music. The philosophy, the teaching and learning activities for music and drama have already been described in considerable detail in the chapters dealing with Drama and Music. In addition to the music and drama activities, the auditorium will be used for:

1. Class and large group meetings.
2. Large group testing programs.
3. Public speaking and assembly programs.
4. Community uses.

Special Conditions

A projection booth for movies shall be provided and a commercial-size screen shall be available on stage with a retracting potential. A ticket sales booth and a lobby area shall be provided.

The music department will use the auditorium extensively. If the stage of the auditorium is so located in relationship to the band practice room and the chorus practice room that these areas can be used as tune-up rooms for major musical programs being presented, it will save considerable behind stage space.

The auditorium shall be composed of four areas.

1. The acting area
2. Scenery space
3. Working and storage space
4. Spectator seating space

The Acting Area

The stage will be of the proscenium type; however, arrangements shall be provided for a hydraulic lift or similar equipment so that the stage may easily and quickly be converted into the open or thrust type stage.

A. Proscenium (audience in one compact group within a narrow, horizontal angle; performers relate their actions to the whole audience simultaneously).

1. Shape

   Quadrilateral space within the proscenium (picture frame) arch extending upstage from the audience.

2. Size

   a. Proscenium opening—maximum 50′; minimum 26′

   b. Quadrilateral acting area—maximum 50′ x 25′; minimum 25′ x 20′

B. Open or thrust stage (recalls production styles of Elizabethan England, therefore, accommodates Shakespeare's best).

1. Shape

   Semicircle, quad, or polygon projecting a proscenium or from an architectural facade. There is seating on three sides of this arrangement.

2. Size

   a. Acting area—maximum 25′ x 35′; minimum 20′ x 26′

C. Arena (arrangement minimizes scenery and maximizes performer-audience intimacy).

1. Shape

   Circle, square, rectangle, polygon, surrounded by seating; entrances from diagonal corners and in the middle of one or both long sides.

2. Size.

   Maximum 30′ x 25′; minimum 20′ x 15′

No special plans need be made for the arena-type stage. With ingenuity in arrangement and appropriate use of screens and other separators, the arena-type stage can be readily set up in the available space.

Scenery Space

Scenery establishes local atmosphere and mood. Locale and action of many plays demand rapid and easily made changes of scenery which require proper space and equipment to perform each function.

A. Broad function of scenery

1. Enclosed and delineates the acting area.
2. Supplies openings of proper form and in sufficient number and location so that the actors may enter and exit the acting area.
3. Masks the stage wall, machinery crews and actors awaiting entrances.

B. Proscenium

Space surrounding the acting area. The scenic emphasis of the proscenium stage demands space sufficient to accomplish its basic function: to create illusions, three-dimensional or two-dimensional. Many sets require a space twice as deep as the acting area and one and a half times as wide. These requirements are established by the scenic functioning that takes place during the production. The production which requires varied and quickly changed sets represents the peak load of the stage space.

1. Scenery space must be cleared of one set before the other can be brought into it.
2. There must be storage space to accommodate all the sets.
3. Paths of movement of scenery must be cleared of obstacles.
4. The fewer the pieces into which a set must be divided to strike it and the fewer parts which must be fitted and joined to assemble it, the more rapid may be the scene shift and the better may be the scenery.
5. Scenery occupies space when stored.

Scenery storage is managed in a number of different ways including the use of (a) a revolving stage, (b) fly galleries, (c) rolling divided wagons, (d) rolling jackknife wagons.

Working and Storage Area

The Stage Floor

The stage floor should be considered as an important part of the stage equipment to be designed especially for its particular uses. There must be a suitable level upon which the actors may perform, adaptable to the requirements of several or all types of performances, and a level area upon which scenery may be set and shifted.

1. Many plays demand entrances through the stage floor in the form of stage traps.
2. Red line essential.
3. Texture tough wear resistant wood which at the same time is receptive to nails and hand-driven stage screws. *No Maple, birch, oak or other hardwood flooring.*

Backstage Operations

Provisions must be made for:

1. Adjustment of permanent equipment.
2. Varying demands of theatrical production; stage equipment (floor, act curtains) either movable or removable.
3. Fly equipment—transistorized, electronic.
4. Cyclorama—permanent.
5. Light bridge for eye.

Dressing Rooms

Location—central to all backstage; large dressing rooms.

Make-up tables with sufficient lighting and mirrors, costume racks, showers (two or three in each dressing room), and a toilet in each dressing room also.

Loading Door

Five feet wide—12 feet high at side of stage.

Loading Platform

Roofed; average van height; avoid change of level.

Receiving Space

Minimum of 200 feet; 20 feet high.

Green Room

A room where a performer waits his time to enter on stage shall be provided, one for each sex. Because of their function, their location shall be readily accessible to the stage.

Spectator Space

300 - 400 seats are needed.

TABLE 11.1

SUMMARY OF SPACE NEEDS FOR THE PERFORMING ARTS AUDITORIUM

Area Designation	Size	Est. Sq. Feet
Auditorium	300 - 400 seats	4,000
Acting Area—Proscenium	50′ x 38′	1,900
Apron	12′ x 50′	600
Wings	30′ x 38′	2,280
Backstage Area[a]	110′ x 40′	4,400
Total		13,180

[a] Includes dressing rooms, green rooms, etc.

It should be noted that the requirements do not include the various shops, classrooms and practice rooms detailed in Chapters XII and XIII.

Special Requirements

1. The practice stage must be isolated sound wise from the stage craft shops. Further, there must be sound proofing between the work backstage and the audience. The lighting in the practice area shall provide for a minimum of lighting variations. A dual function practice stage involving music and drama is desirable.
2. Exits from the stage craft areas must be of sufficient size to expedite the movements of sets to and from the theatre.
3. It seems desirable to have a grid out front over the audience for light effect. A revolve is preferable to lofting. A revolve would require at least two trap doors.
4. Traps under the floor are desirable to provide certain kinds of acting facilities.
5. Artificial light flexibility is absolutely essential, and the controls

must be located so that they can be properly handled from a director's booth.

6. Space for carpentry, painting, dressing, costuming and green room are all essential. In addition, storage areas should be given consideration. It is desirable to have a trial area set up with stages; but, of course, this can always be the regular stage. It is suggested that a permanent cyclorama three-fourths of the height of the stage area be provided for permanent effects in the theatre.

7. The green room is a preparation room for the actors before they go on stage and should include provision for closed circuit television (stage view), sofas, chairs, coffee table and a kitchen just off this room.

8. Lighting and Sound Equipment.

   a. Lights

      (1) Three beams before proscenium arch with light bridges.

      (2) Number of light battons behind proscenium; depends upon size of stage.

      (3) Patch panel backstage.

      Light booth—rear of audience with view of stage.

      Communication with stage manager and director in the audience.

   b. Sound

   Separate speaker system for both backstage and auditorium.

   Both systems should, however, be controlled from the same booth, preferably the lighting booth.

9. Acoustics

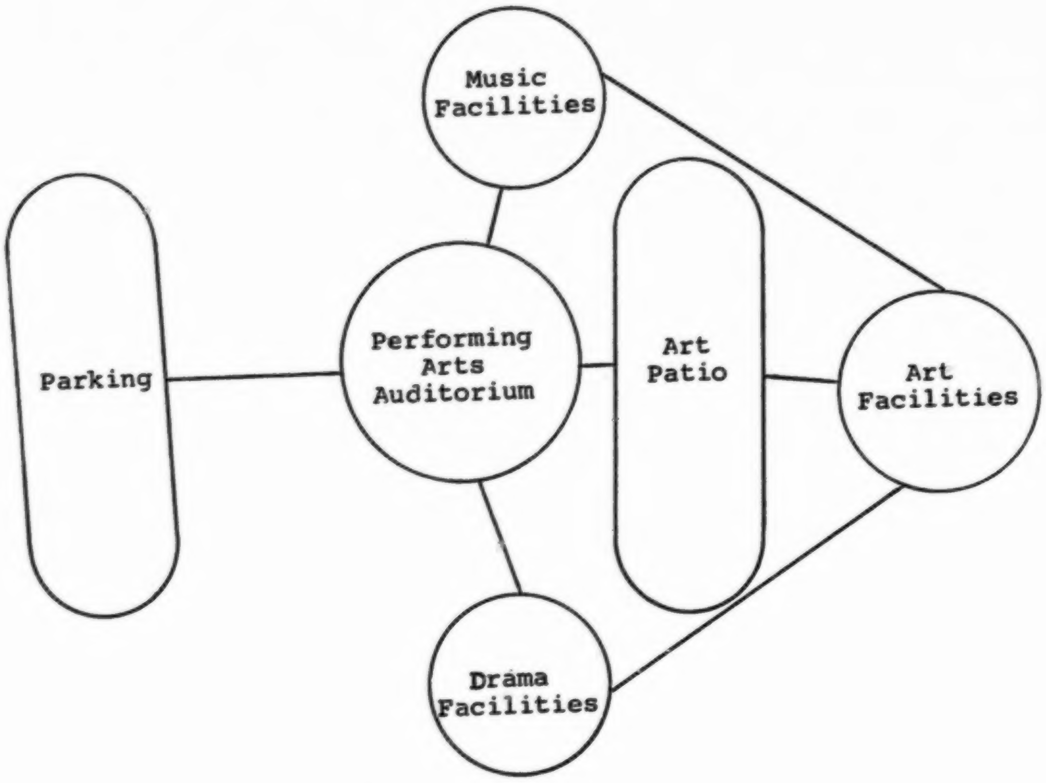
   Extreme care should be given to the acoustics of the performing arts building. The quality of the acoustics should not be left to chance, but the standards should be specifically referred to in the specifications and the contract.

Relationships

The relationships of the performing arts auditorium to music, drama and art are shown in Figure 11.1.

FIGURE 11.1

FUNCTIONAL RELATIONSHIPS OF PERFORMING ARTS AUDITORIUM TO OTHER FUNCTIONS


Music Facilities
Parking
Performing Arts Auditorium
Art Patio
Art Facilities
Drama Facilities

XII

MUSIC FACILITIES

Philosophy and Objectives of the Music Program

Music expresses ideas and emotions in a number of significant forms through rhythm, melody and harmony. As a truly universal language, it has a strong appeal to nearly all people. Within the community college, some students will appreciate certain music forms, some will wish to participate in musical activities and a few will seek the knowledge, skills and artistic sensitivity required to become performing artists. The music program must be based on the philosophy that each of these three groups will find opportunities for increased appreciation, understanding, participation, skills and performance.

The music department in its presentations of recitals, choral programs and concerts can exert a great cultural influence upon the community and at the same time build strong support for the college.

In general, the four chief objectives of the community college music program are:

1. To improve a student's appreciation of music.
2. To increase a student's participation in musical presentations and the satisfactions that come from musical training.
3. To acquire a fuller understanding of the variety of music forms and to develop a personal standard of values for judging quality.
4. To encourage the beginning and the continuance of music education with the purpose of becoming a performing artist, a teacher or for the enjoyment that comes from a life-time leisure activity that can bring pleasure to many.

The special student, the general student and community needs can be met in these four objectives.

The Music Curriculum

For Non-Majors

College chorus—open to all students, can repeat three times.

Community chorus—open to all students.

College Band—open to all students, can repeat three times.

Introduction to Music literature—non music majors.

History of Music—non music majors.

Uusually 2½ to 3 contact hours for each credit hour.

For Music Majors

Survey of music literature.

Music theory (a) beginning, (b) intermediate, (c) advanced.

Fundamentals of music—primarily, but not exclusively for music majors.

Applied music—individual instruction—voice, piano, organ or other instrument.

College symphony—required for instrumental music majors.

Light opera—elective course, all music majors.

These are typical junior college courses. The introduction to music literature is mainly devoted to directed listening to various music forms.

Description of Teaching and Learning Activities

Typical teaching activities in music include: instructing, explaining, discussing, demonstrating, listening to choral and instrumental performances; evaluating; holding auditions; using recordings, sound equipment, T.V. and central RAMP facilities.

Typical student activities include listening to lectures and discussions, taking notes, asking questions, singing or playing musical instruments alone or in groups, practicing, reading, listening to recordings and criticizing performances of self and others.

Emerging Concepts and Developing Trends

In music the increasing trend is toward small group activities. Even in situations where a sizable number of students are brought together for a performance such as in a band, symphony or choral group, most of the instruction is accomplished in the smaller group.

A second trend of significance is the development of music skills for leisure-time activities.

Student Groups

The estimated number of music students will be eight per cent of the total FTE enrollment of 5,000 students. This is 400. Of the total contact hours, music will generate 3.8 per cent. This will require 30.4 class periods per week for the estimated 608 contact hours.

Class size will differ according to the program offered. The following are guidelines:

Vocal music	60-65 students
Band	70-75 students
Orchestra	50 students
General music classes	30 students

Faculty

On the basis of 30.4 class periods per week, the music program will require three full-time teachers. Special techniques are involved with orchestra, band and choir; therefore, to be effective in instruction, a specialist should be provided for each of the specified music areas. Since music teachers are educated in a broad base as well as in their specialty, each one of them should be able to teach the general music course work and assist in the various areas of the adult education program. However, part-time instructors might well be used for private lessons.

General Space Considerations

As indicated elsewhere in this Report (Chapter XI), music will share with drama in the use of the auditorium for performing arts.

Band and orchestra will share a rehearsal room. The choral rehearsal room will be separate.

Spectator space will not be provided except in the auditorium. The main consideration is teaching, rehearsal and practice space.

Music offices will be provided in the music facility.

Movable chairs with swing-down table arms will be used generally in the music area.

Special Space Characteristics and Descriptions

General Music Classroom With Electronic Piano

This space should be designed to accommodate 30 students. Typical student activities will include playing piano, listening through earphones,

TABLE 12.1

SPACES NEEDED FOR THE MUSIC PROGRAM, NORTH CAMPUS, SEATTLE COMMUNITY COLLEGE

Type of Space	Number of Units
Music Classroom with Electronic Piano	1
Choral Rehearsal Room	1
Band-Orchestra Rehearsal Room	1
Instrumental Storage & Uniform Room	1
Choral Music Storage & Uniform Room	1
Practice Rooms	8
Teaching Studios	3
Offices	7
Auditorium for Performing Arts (Shared with Drama)	[a]
Total Spaces	23

[a] Described in Chapter XI.

discussing, listening to lecture, taking notes, reading and questioning th instructor. Typical professional activities will include lecturing, leadin discussions and criticizing, demonstrating piano techniques, using chalk board and using electronic piano equipment.

Choral Rehearsal Room

Choral Rehearsal Room

This room should be designed to accommodate 100 students. Th space is intended to be used primarily for the teaching of choral mus Additional justification of this space is its anticipated evening use f course offerings in adult general education and music appreciation. Typic student activities will include listening, questioning, singing, sitting a standing. Typical professional activites wll include explaining, listeni to musical performance, directing musical performance, using chalkboa and demonstrating musical techniques.

Band and Orchestra Rehearsal Room

This area should be designed to accommodate 110 students. The ar of 2,400 square feet is intended to be used primarily for the teaching instrumental music. A portion of the justification of this space will be anticipated evening use for course offerings in adult general education. Typical student activities will include listening, questioning, playing musical instruments, sitting and standing. Typical professional activities will include explaining, listening to musical performance, directing musical performance, using chalkboard and demonstrating musical instrument techniques.

Instrumental Storage, Uniform Room and Music Storage

This space will be used for the following purposes:

1. Musical instrument storage.
2. Uniform storage.
3. Minor musical instrument repair and maintenance.
4. Occasionally as a dressing room.
5. Music storage.

Typical student activities will include storing musical instruments, hanging up uniforms, repairing musical instruments, servicing musical instruments, washing up and cleaning up and changing clothes. Typical professional activities will include storing instruments, repairing instruments, servicing instruments, washing up and cleaning up.

Choral Music Storage and Uniform Room

It is recommended that one room or space be provided. This space is intended to be used primarily for three purposes:

1. Music storage.
2. Robe storage.
3. Occasionally as a dressing room.

Typical student activities will include storing music, hanging robes, washing up and cleaning up and changing clothes. Typical professional activities will include storing music, washing up and cleaning up.

Practice Rooms

It is recommended that eight practice rooms be provided. Five rooms should be designed for use by one to three students; three rooms to be designed for 6 to 8 students. These rooms are intended to be used primarily for single or small group student music practice. It should be recognized that heavy use of these spaces is anticipated during both the day and evening. While not primarily instructional spaces, these spaces house activities which directly support the instructional program in music.

Typical student activities will include practicing piano, voice and other musical instruments. Although these spaces are intended primarily for student use, it is anticipated that occasionally some music instruction will take place in these rooms.

Teaching Studios

Three teaching studios containing 400 square feet each should be adjacent to the faculty offices. Student conferences with music teachers often involve the discussion of interpretations, tone production, technical facility and other aspects of musical performance. Discussion of this nature rightly belongs in the music area complex where pianos and recording equipment are readily available. The teaching studios should include room for a piano, desk, shelving, file, music stand and room to confer with and assist students in music.

Faculty Offices

The six faculty offices suggested, each of 80 square feet, would be used for full-time faculty.

Furniture and Equipment Needed

General Music Classroom - Equipment and Furniture, Built-in

1. Convenience outlets along walls: 4 rows of 6 floor outlets (connected with master control at the front), recessed to floor level.
2. Chalkboard, 16 lineal feet (unlined).
3. Chalkboard, 16 lineal feet, pulldown type (staff lined).
4. Tackboard, 4 lineal feet.
5. Acoustical treatment and isolation.
6. Air conditioning is recommended.
7. Cabinet or other storage space for music folders.

General Music Classroom - Equipment and Furniture, Movable

1. 30 tablet armchairs with swing-down arms.

2. Tape recorder.
3. Metronome.
4. One six-foot grand piano.

Choral Rehearsal Room - Equipment and Furniture, Built-in

1. Four-level floor, main floor plus three permanent risers: back risers 8′ wide, middle and front riser 42″ wide.
2. Chalkboard, 16 lineal feet (staff lined).
3. Chalkboard, 8 lineal feet, pulldown type (unlined).
4. Tackboard, 8 lineal feet.
5. Generous lockable cabinet storage shelves at front for sheet music.
6. Air conditioning recommended.
7. Two front corner permanent-mounted stereo speakers.
8. Two egress points to room exterior, sound proof door treatment.
9. One egress point to choral storage room, standard door treatment.
10. Darkening capability and provision for audio-visual presentation capability.
11. Conduit or other provisions for educational television capability. (See RAMP requirements.)

Choral Rehearsal Room - Equipment and Furniture, Movable

1. 100 chairs with fold-down arms.
2. Two 8′ x 4′ tables in lieu of desk.
3. One 6′ grand piano with bench.
4. One director's podium.
5. One director's chair.

Band and Orchestra Rehearsal Room - Equipment and Furniture, Built-in

1. Standard lighting treatment.
2. Air conditioning recommended.
3. Multi-level floor, main floor plus permanent risers with capacity for 20 students on each level, back risers 8′ wide, middle and front riser 4′ wide.

4. Considerable storage should be provided in back of room for larger instruments for band and orchestra. (Tympani, drums glockenspiel.)
5. Chalkboard, staff lined, 16 lineal feet.
6. Chalkboard, unlined, pulldown type, 8 lineal feet.
7. Tackboard, 8 lineal feet.
8. Two front corner permanent-mounted stereo speakers.
9. Darkening capability and provision for audio-visual presentation.
10. Sound controlled to exterior and good interior acoustical treatment.
11. Sufficient front-of-room space for movable choral riser.
12. Two access points to instrument storage and uniform room; large doors are needed.
13. Two access points to room exterior with sound proof door treatment.
14. Conduit or conduit chase for educational television capability (See RAMP requirements.)
15. Convenience outlets along walls on 10 foot centers.

Band and Orchestra Rehearsal Room - Equipment and Furniture, Movable

1. 110 chairs with fold-down arms (heavy-duty steel).
2. 40 music stands.
3. 1 piano with bench.
4. Director's podium
5. Director's chair (on podium).

Instrumental, Uniform and Music Storage - Equipment and Furniture, Built-in

1. Two sinks with mirrors above.
2. Three foot width shelving, three foot spacing, 90 lineal feet.
3. Uniform storage (hanging type, with wide shelf above) 3′ depth, 30 lineal feet.
4. Music repair area.
    a. Work counter, 8 lineal feet (adequate light).
    b. Compressed air line.

5. Two full-length mirrors.
6. Two access points to instrument ensemble room, large door treatment.
7. Standard lighting treatment.
8. Standard utility floor treatment.
9. Standard wall and ceiling treatment.
10. Standard ventilation treatment.

Instrumental, Uniform and Music Storage - Movable Uniform Storage Racks Mounted on Castors

See above for specific measurements. After rack is filled, it would be rolled into enclosed space.

Choral Music and Uniform Storage Room - Equipment and Furniture, Built-in

1. Robe storage (hanging type with wide shelf above) 15 lineal feet, three feet deep.
2. Sink, with mirror above.
3. Two full-length mirrors.
4. Standard lighting treatment.
5. Standard utility floor treatment.
6. Standard wall and ceiling treatment.
7. Built-in wall cabinet shelves, floor to ceiling, 10 lineal feet (for musical materials).
8. One access point to choral ensemble room, sound proof door treatment to avoid sound leakage to other teaching areas.

Choral Music and Uniform Storage Room - Equipment and Furniture, Movable

1. 8 legal 5-drawer filing cabinets.
2. Hanging robe storage racks for built-in robe storage (see above); should be mounted on castors.

Practice Rooms - Equipment and Furniture, Built-in

1. Standard lighting treatment.
2. Acoustical in terms of volume of sound developed.
3. Air conditioning strongly recommended.
4. Sound proof door treatment with small window in door.
5. Two convience outlets along walls.

Practice Rooms - Equipment and Furniture, Movable

1. 4′ x 5′ upright piano with bench (in three of the eight practice rooms).
2. Two music stands.
3. Three straight-backed student chairs with no arms.

Teaching Studios - Equipment and Furniture, Built-in

1. Air conditioning strongly recommended.
2. Standard lighting treatment.
3. 4′ x 18′ mirror.
4. Acoustical treatment.
5. Convenience outlets along walls on 10 foot centers.
6. Tackboard, 4 lineal feet.
7. Chalkboard, 8 lineal feet (staff lined).

Teaching Studios - Equipment and Furniture, Movable

1. 7′ x 5′ grand piano with bench in one studio.
2. 5′ x 4′ upright piano with bench in two studios.
3. One 4-drawer file in each studio.
4. 30 lineal feet of standard book shelving.
5. Standard office cabinet with shelving.
6. Teacher's desk with chair.
7. Four straight-back student chairs without arms.

8. One music stand.
9. One metronome.
10. One record player.
11. One tape recorder.

Faculty Offices - Equipment

No additional equipment will be required for three offices over and above what is shown in teaching studios. Three offices will need teachers' desks and chairs, one music stand and 4 straight-back student chairs without arms.

Space Summary

Table 12.2 includes the suggested space needs for the Music Program.

Facility Relationships

Figure 12.1 is a diagram of the functional relationships of the facilities for music.

TABLE 12.2

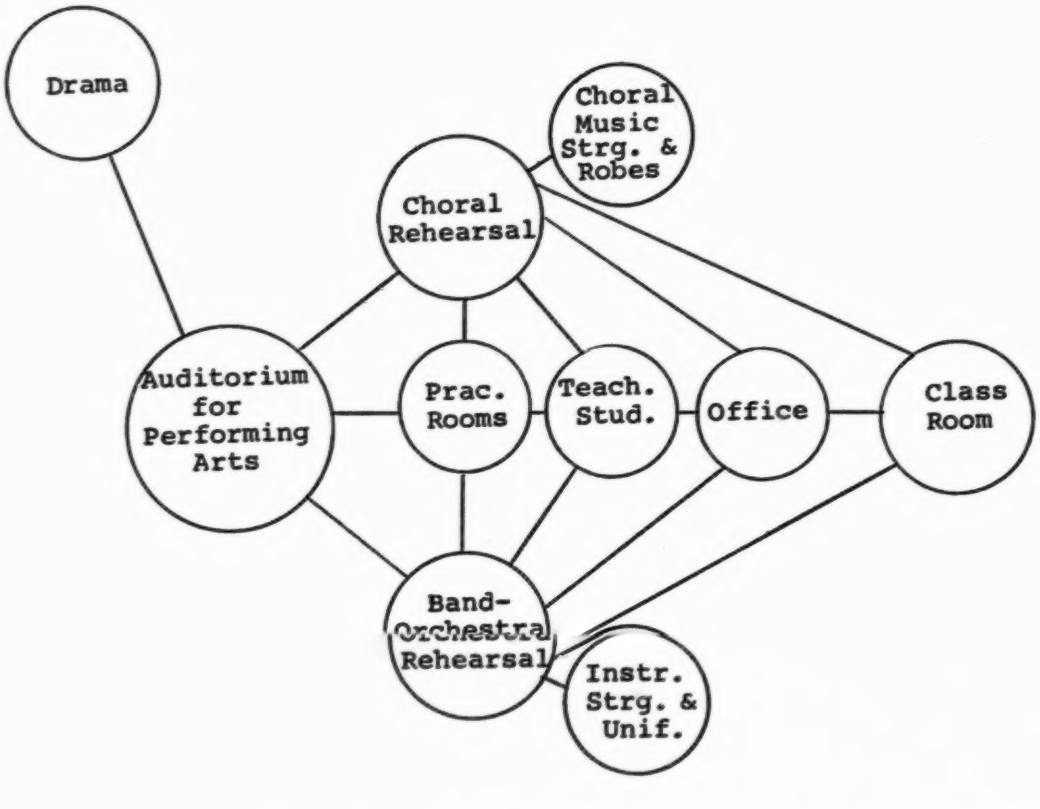
SUMMARY OF SPACE NEEDS FOR THE MUSIC PROGRAM

Type of Space	No. of Units	Sq. ft. per Unit	Total Approx.
Classroom	1	800	800
Choral Rehearsal Room	1	2,400	2,400
Band-orchestra rehearsal room	1	2,400	2,400
Instrument storage and uniform room	1	480	480
Choral music storage and uniform room	1	120	120
Practice Rooms	8	70	560
Teaching Studios	3	400	1,200
Offices (Daytime faculty)	6	80	480
Offices (Evening faculty)	4	20	80
Auditorium for Performing Arts	1	(a)	(a)
Total	27		8,520

[a] The educational specifications are shown in Chapter XI.

FIGURE 12.1

RELATIONSHIP OF MUSIC CURRICULUM TO NON-MUSIC FUNCTIONS


Drama
Choral Music Strg. & Robes
Choral Rehearsal
Auditorium for Performing Arts
Prac. Rooms
Teach. Stud.
Office
Class Room
Band-Orchestra Rehearsal
Instr. Strg. & Unif.

XIII

DRAMA FACILITIES

Philosophy and Objectives

Drama is a literary presentation of prose or poetry that depicts in a vivid, moving manner in monologue, dialogue or pantomine the struggles and conflicts of man and his world. The material presented may be deeply philosophical in nature, involving the fundamental questions of man's existence, or it may be limited to the conflicts and problems in the mind and spirit of one individual.

The purpose of drama is to help each person understand himself and his world and through this understanding to discover a sense of inward harmony and the ability to relax even in tension-filled situations.

In a comprehensive community college, the objectives for drama will be varied. For example,

1. For drama majors, the objectives will be occupational in nature. A careful balance of theoretical and practical work of high quality is essential.
2. For other full-time students, the objective will be to provide an opportunity for participation and study up to the limits of the student's interest and ability.
3. For the adult part-time student and the community in general, the objective will be to utilize audience participation, to develop artistic appreciation based on understanding and to provide a creative appreciation based on understanding and to provide a creative leisure time activity that can contribute to the growth and development of the individual.

As a result of these varied objectives, the drama program in the community college will be distinctly different from those found in either the four-year college or the high school. The open-door policy means that the community college seeks to expand student horizons through the use of a broader program than either the high school or the four-year college currently offers. As a result, the position of drama in the community college should permit a unique series of functions designed to meet community needs. The teaching function is the major concern in both the day and evening programs. The program must have high quality in both the courses and the facilities if the objectives are to be reached. Little theatre productions and workshops are essential.

Drama Course and/or Curriculum Development

The drama facilities and curriculum are designed in the transfer program as general education courses but must also provide for a major area. A student may carry a maximum of six quarters of work in his first two years in the drama theatre.

In the general adult high school and basic skills programs, students may participate in a semester course in which they begin to understand the intricacies of theatre and develop a deeper appreciation for the whole field. Provision should also exist for extending the number of courses available to students in this program.

Courses Taught and Projected Enrollments by Classroom Course

	No of Students
History of Drama or the Theatre	60 - 70
Playwriting	10 - 15
Begining Pantomine	20
Beginning Acting	20
Intermediate Acting	15
Advanced Acting	5
Stagecraft	20 - 25
Stage Make-up	20 - 25
Play Production	Unlimited
Lighting Techniques	20 - 25
Theatre Voice	20
Theatre Speech	20
Theatre Design	15
Specialized Acting School	20
Directing Courses	20
Costuming	10 - 15

Community Service Courses

In addition to the courses already listed, the following courses will be available upon the request of a sufficient number of students to justify their inclusion.

Introduction to the Theatre
Play Analysis
Theatre Production
Play Production
Creative Dramatics
Theatre Management
Acting Workshop
Directing Workshop
Technical Workshop
Theatre Forum

Description of Teaching and Learning Activities

Teacher activities will entail demonstrations, lectures, readings, experiments and provision for interaction between music and drama, art and drama, etc. Essentially the drama area is visualized as a laboratory operation. However, academic courses will definitely have their place with the transfer student, particularly in the field of theatre history and related areas.

Students will build stage sets; they will perform simple to complex plays; they will experiment with various techniques of lighting, of sound reproductions and all the other elements related to contemporary theatre.

The drama teaching area should be located in close proximity to the teaching and Fine Arts Auditorium because all stage settings and scenery will be developed in the teaching area and moved to the theatre. In the teaching program for drama, there are three basic kinds of theatres. There is a proscenium type theatre, theatre in the round, and Elizabethan or thrust theatre. It seems desirable to find some combination of these elements within budget limitations. Backstage space qualities are of prime importance; there must be room for space scenery or scenery construction, for dressing and for some part rehearsals. The proscenium area needs a 35 foot opening maximum with a 26 foot minimum and a head space of 19 feet. The quad area of this should be 35′ by 25′ maximum or 25′ by 20′ minimum. The thrust type theatre must have in the quad area 35′ by 25′ maximum to 25′ by 20′ minimum. The theatre in the round requires no scenery, just furniture; therefore, space on stage is determined by each play. It is imperative that the construction of the stage floor be of a soft wood.

Emerging Concepts or Trends

The most widely used type of theatre is the proscenium. A growing trend indicates that both the thrust type and the theatre in the round are becoming more popular.

Unmet community needs give justification for providing a facility which supplements community service programs. Further considerations include the growth of non-professional interest in theatre and the encouragement of meaningful leisure time activities.

Student Groups

There will be a range in class size from as few as two or three to about thirty with an average size of twenty students. Laboratory work will usually involve 15 to 20 students. No characteristics of students are noted except those that conceivably relate to metropolitan area community college students. It is estimated that the total enrollment in Drama on the North Campus will account for .7% of the total enrollment. This will amount to 376.3 student credit hours, which will require 1 classroom for 18.82 periods.

Faculty and Staff

Two teachers will comprise the staff of the drama program at the outset, but if the program develops, it is reasonable to expect that this number may double in the years ahead. It was noted that two offices, 80 square feet each, adjacent to teaching stations, would be required.

Space Requirements

The following spaces are necessary for the development of a quality drama program:

1—Auditorium for performing arts—described elsewhere.

1—An academic classroom.

4—Shops including a *scene shop*, a *paint shop*, a *costume shop* and a *property construction shop*.

2—Offices.

Description of Spaces

The academic classroom will be 600 square feet and will be equipped with 25 single tables and chairs, a teacher's desk and a lecturn. Twelve feet of chalkboard and eight feet of bulletin board space shall be provided.

The room shall have television reception potential, an audio-visual screen designed to eliminate keystone effect and a single storage cabinet for storing stage effects as well as an outlet for RAMP central in the theatre—video tape, etc. It should be located near the auditorium and immediately adjacent to the make up and dressing rooms described later.

Scene Shop

The scene shop should contain approximately 1,000 square feet. The following is needed:

1. Storage.
2. Billboard—masonite, 8′ x 4′ plywood.
3. Storage for rolls of cloth.
4. Cabinets for small supply items.

Property Construction

This shop will function as the space for construction of scenery for production. Students will be taught and will gain actual experience in the construction of stage scenery.

In the property construction shop, the following tools are desirable:

1. Pull over saw.
2. Saber saw.
3. Mortiser.
4. Jointer.
5. Drill press.
6. Router.
7. Flat Tables, 6′ x 16′.

This space should contain approximately 1,500 square feet. It should have sufficient height to store 18′ scenery panels. It should have a concrete floor that can be washed.

Paint Shop

The paint shop should contain approximately 1,500 square feet and the following items of equipment are desirable:

1. Heat dryer.
2. Paint storage cabinets.
3. Sink for cleaning brushes.
4. Drop and flat elevator lift.
5. Brush racks.

6. Color-corrected fluorescent lighting.
7. Exhaust system.

Costume Shop

The costume shop should contain 800 square feet and the following equipment is needed:

1. Three sewing machines.
2. Washer and dryer.
3. Cutting tables, 4′ x 7′.
4. Wardrobe racks.
5. Ironing boards.

A further description of the special requirements for drama is included in the chapter dealing with the Auditorium for Performing Arts.

Practice Stage

The practice stage must be isolated sound-wise from the stage craft shops. The floor should be of soft wood. Lighting should be controlled and should provide for the intensities and variations suitable for the drama presentations anticipated.

The proscenium of the practice stage should have a width of 35 feet, a depth of at least 50 feet with 38 feet behind the curtain and a 12 foot deep apron.

The area surrounding the stage should accommodate 75-100 folding chairs which can be moved in to accommodate the need for seating when desired. This is not intended to duplicate the auditorium but to allow rehearsals and an occasional drama presentation.

Exits onto the practice stage should provide for the movement of materials and sets, props and other devices from the shop areas.

Space Summary

Table 13.1 includes a summary of the space needs for drama.

Facility Relationships

Figure 13.1 is a diagram of the functional relationships of facilities proposed for drama.

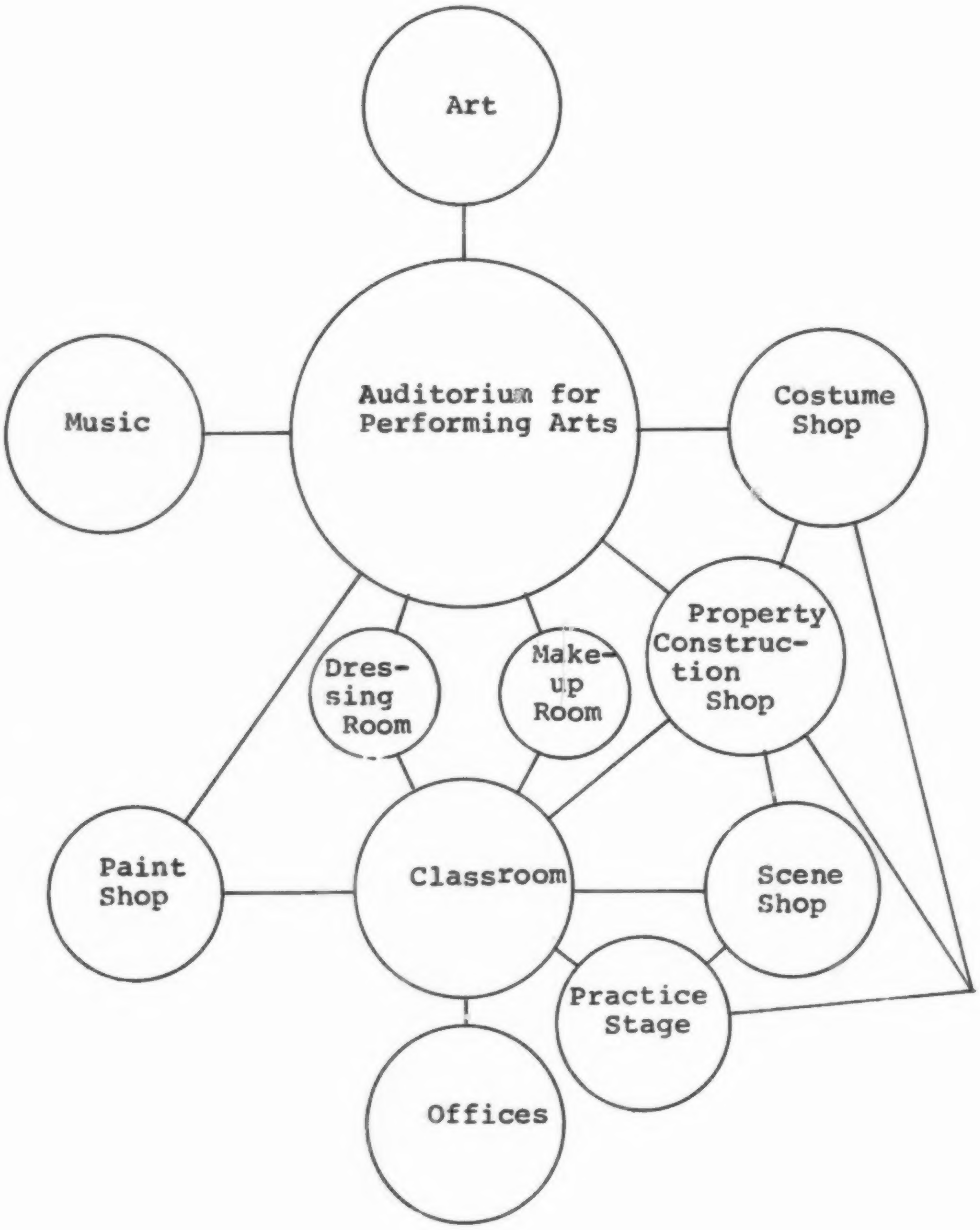
TABLE 13.1

SUMMARY OF SPACE REQUIREMENTS FOR DRAMA

Type	Number	Sq. Ft. Each	Sq Ft. Total
Classroom	1	600	600
Make-up dressing rooms	2	200	400
Scene shop	1	1,000	1,000
Paint shop	1	1,500	1,500
Property-storage shop	1	1,500	1,500
Costume shop	1	800	800
Offices	2	80	160
Performing Arts Auditorium	1	(shared with music)	(a)
Practice Stage	1	3,250	3,250
Total			9,210

[a] Dimensions given elsewhere

FIGURE 13.1
SPACE RELATIONSHIPS, DRAMA PROGRAM


Art
Music
Auditorium for Performing Arts
Costume Shop
Dres-sing Room
Make-up Room
Property Construc-tion Shop
Paint Shop
Classroom
Scene Shop
Practice Stage
Offices

XIV

ART FACILITIES

Philosophy and Objectives

The art curriculum should recognize the need which all individuals have to express themselves and should encourage participation in art activities on as wide a basis as possible. Art exists everywhere, in many forms and in many things. This area of the instructional program should play a vital role in the cultural activities of the individual, the College and the community.

The art curriculum should seek to achieve the following basic objectives:

1. Provide courses and enrichment activities so that occupational students are given the opportunity to experience and participate in the areas of human endeavor that make life more meaningful and "worth living."
2. Provide opportunities for the adult general education student to participate in art activities so that he may receive the intellectual stimulus to increase his knowledge of the world of art and at the same time provide opportunities for him to participate in meaningful activities that will challenge his creativeness.
3. Provide opportunities for the student who wishes to transfer to a four-year institution to achieve the skill and knowledge essential to the successful completion of upper division work. Courses for the art major are important to this objective.
4. Provide a program of art that will play a vital part in the cultural activities of the community. The art curriculum has a responsibility to the community and through community service activities, such as lectures, exhibits, etc., it should extend the appreciation of art into the life of the community.

Emerging Concepts

The arts have developed out of an inner human need. While most of our emphasis in human activity is on "team effort," the individualism of the arts has become increasingly apparent. Self-expression and individual differences in the arts have never been more important to society than today. The art curriculum should provide activities challenging the individual as a creative artist or, as consumer and interpreter of art, to fulfill the need for self-expression as an integral part of a fully rounded life. The contribution of the arts to the functional competence of a citizenry who lives in a society that he understands and controls is becoming increasingly important.

The expanded use of television and other media for the communication of images has increased the complexity faced by the art student in the development of self-expression. Art education will have a great responsibility to teach students how to evaluate the impact of an individual piece of art or mass image communications upon themselves and upon society. Individual efforts to develop self-expression will continue to broaden the spectrum of media and techniques to be taught by the community college.

The Educational Program

Courses to be taught in the art curriculum include the traditional lower division art courses for college transfer, courses of adult general education and survey type courses for non-art majors.

A program of occupational/commercial art is being planned for the North campus; therefore, no provision is being made for facilities for this area at the South Campus.

Course offerings in art are projected to include:

1. **Survey type**
    - Introduction to the Visual Arts
    - Art in the 20th Century
2. **Non-Survey**
    - Drawing
    - Design
    - Photography
    - Commercial Design/Lettering
    - Jewelry and Metal Work
    - Printmaking
    - Painting
    - Ceramics
    - Sculpture

Individual Space Requirements

The following types of spaces should be provided:

1. Drawing and Painting Studio.
2. Design Studio.
3. Ceramics Studio
4. Sculpture Studio.

5. 3-Dimensional Art Studio.
6. Darkroom.
7. Printmaking Press Room.
8. Art Student Locker Area.
9. Faculty Offices.

Drawing and Painting Studio

This studio will require 1,500 square feet of assignable area. This space should be designed to accommodate 20 students and is intended to be used primarily for the teaching of drawing and painting. It should be recognized that during the unscheduled portions of the day the space will be used by students for work on regular class projects and for practice and perfection of drawing and painting skills. A portion of the justification of this space will be its anticipated heavy evening use for course offerings in adult general education.

Typical student activities include painting, drawing, discussing, criticizing, preparing paints and other materials, washing up/cleaning up tools, equipment and self, and sketching.

Typical professional activities include lecturing, leading discussions and criticizing, demonstrating techniques, demonstrating tools and materials, using blackboard, evaluating projects and displaying projects.

There should be a storage room at each end of the studio of approximately 100 square feet each. The two activities of drawing and painting in the studio should be separable by a visual screen. At times when one of the activities has a larger group using the studio than the other activity, the screen can be moved to provide more room for the larger group. One storage room will service painting, the other drawing. Because of the dual use of this space, two doors should provide access to the space, one near one end of the space and one at the other end.

Equipment and Furniture, Built-in

1. Movable and easily adjustable spotlighting should be provided for the space through the use of ceiling rails or tracks.
2. A washdown floor is needed for the space, possibly of treated concrete.
3. Two sinks with hot and cold water (with quick-clean plaster traps) with adjacent countertop (chemical resistant) should be provided at or near one end of the space.

4. One sink (with quick-clean plaster trap) with adjacent (chemical resistant) countertop should be provided at or near the other end.
5. Locked storage should be provided under the countertops at each end of the space.
6. 20 linear feet of tackboard/displayboard are needed.
7. 16 linear feet of chalkboard should be provided.
8. Hanging rails should be provided on the ceiling for hanging projects and displays.
9. 50 linear feet of 18" shelving should be provided in each of the two storage rooms.
10. Two entrance doors should be provided to the space.
11. Convenience outlets should be installed along walls on 10 foot centers and three outlets in the floor.
12. Coaxial conduit or conduit chase for educational television capacity should be planned (see explanation of RAMP requirements elsewhere in this document).
13. Color corrected lighting.

Equipment and Furniture, Movable

1. 20 art donkeys, or equivalent.
2. 20 art stools.
3. 25 art easels.
4. 2 movable raised platforms 2′ x 4′ x 4′.
5. 25 paint-pot and pallette tables.
6. Instructor's desk.
7. Instructor's chair.

Design Studio

It is recommended that one laboratory be provided. This space will require 750 square feet of assignable area and should be designed to accommodate 20 students.

This studio is intended to be used primarily for the teaching of design. It should be recognized that during unscheduled portions of the day the space will be used by students for work on regular class projects and for practice and perfection of skills and techniques of design. A portion of the justification for this space will be its anticipated evening use for course offerings in adult general education.

Typical student activities include drawing, cutting, sketching, discussing, criticizing, preparing materials, washing up/cleaning up tools, equipment and self, and printmaking.

Typical professional activities include lecturing, leading discussions and criticizing, demonstrating techniques, demonstrating tools and materials, using blackboard, evaluating projects and displaying projects.

Equipment and Furniture, Built-in

1. Standard floor treatment.
2. Two large sinks with hot and cold water for wash-up and material preparation with countertops; sinks should be several feet apart.
3. Locked storage under countertops.
4. Color corrected lighting.
5. 16 linear feet of tackboard.
6. 8 linear feet of chalkboard.
7. Standard wall treatment.
8. Hanging rails should be provided on the ceiling for hanging projects and displays.
9. Air-conditioning recommended.
10. Convenience outlets along walls, 10 foot centers and three floor outlets.
11. Coaxial conduit or conduit chase for educational television capability. (See explanation of RAMP requirements elsewhere in this document.)
12. Standard doors.
13. 40 student lockers, for 18″ x 24″ papers and drawing boards.

Equipment and Furniture, Movable

1. 20 each 3′ x 4′ design tables (drawingboard portion of top tilts, 20″ portion of top does not tilt).
2. 20 art stools.
3. Instructor's desk.
4. Instructor's chair.

Ceramics Studio

It is recommended that one studio be provided. This space will require 600 square feet of assignable area. This space should be designed to accommodate 15 students and is intended to be used primarily for the teaching of ceramics. It should be recognized that during unscheduled portions of the day the space will be used by students for work on regular class projects and for practice and perfection of skills and techniques in the art of ceramics. A large portion of the justification of this space will be its anticipated evening use of course offerings in adult general education.

Typical student activities include measuring material amounts, preparing material for use, moulding and sculpting material, using potter's wheel, storing projects for cure, firing projects, glazing projects, criticizing, discussing, questioning, storing equipment, washing up/cleaning up tools, equipment and self.

Typical professional activities include lecturing, leading discussions and criticizing, demonstrating techniques, demonstrating use of tools and materials using blackboard, evaluating projects and issuing materials. The floor of this studio should be warm.

A service drive should allow service and deliveries to a receiving area.

Equipment and Furniture, Built-in

1. Two large sinks (with easy-clean plaster traps) with countertop work surface. Sinks should be washtub type and several feet apart.
2. Glazing counter should be 10 linear feet in length.
3. Tackboard, 4 linear feet.
4. Open shelves, 20″ wide or 16″ spacing, approximately 30 linear feet are needed.
5. Washdown wall treatment.
6. Washdown floor treatment, easy access drain sump.
7. Convenience outlets along walls on 6 foot centers.
8. Sky lighting, if possible.
9. Standard lighting treatment.
10. Standard door.
11. Forced ventilation.
12. Extra storage shelving for heavy and light ceramics objects, two 16″ wide shelving spaced 24″ apart.

Equipment and Furniture, Movable

1. 10 potter's wheels.
2. 10 stools (low).

3. Two each 4′ x 8′ canvas covered wedging tables.
4. 100 cubic feet humid storage (two cabinets as "damp boxes").
5. One small electric kiln, size 24″ x 18″ x 24″.
6. One large gas kiln (venting requirements), size 6′ x 6′ x 3′.
7. 10 banding wheels.
8. Portable chalkboard, 8 feet.

Activity and equipment areas within the studio should include:

1. One area of approximately 600 square feet. Activities in this area will include mixing, wedging, shaping, sculpting, displaying, criticizing, discussing, washing up and cleaning up. Needed equipment for this area includes a sink, a potter's wheel, wedging tables, humid storage cabinets, chalkboard, counter.
2. Another area of approximately 100 square feet. Activities in this area will include the preparation of glaze materials, glaze projects and the temporary storage of projects awaiting kiln. Dust proof door entrance. Equipment used will include sink, work counter and storage shelves.
3. A third area of approximately 100 square feet is needed for such activities as firing projects and temporary storage of fired hot projects. Equipment in this area will include kilns, storage shelves, etc. Dust proof door entrance. Cupboard for 23 jars of chemicals with balance and dust proof door.
4. A fourth area of 2 small dressing rooms (16 sq. ft. each) to hang clothes and smocks. Lockers should be provided in the dressing area.
5. A storage space of 50 sq. ft. for cement and 100 sq. ft. for storage of packages of clay will be needed.

Sculpture Studio

It is recommended that one studio be provided. This space will require 1,000 square feet of assignable area and should be designed to accommodate 20 students. This space is intended to be used primarily for the teaching of scultpure. It should be recognized that during unscheduled portions of the day and night the space will be used by students for work on regular class projects and for generally practicing and perfecting skills and techniques in the art of sculpting. A portion of the justification of this space will be its anticipated evening use for course offerings in adult general education.

Typical student activities include hammering, chipping, chizeling, sawing, cutting, sanding, storing equipment, storing projects, preparing materials for use, displaying, criticizing, discussing, questioning, welding, casting, polishing, filing, washing up and cleaning up materals, tools and self.

Typical professional activities include lecturing, explaining leading discussions, criticizing, demonstrating techniques, demonstrating tools and materials, using chalkboard, evaluating projects and displaying projects.

Equipment and Furniture, Built-in

1. Two sinks, washtub type (with quick-clean trap) with counter work surface, separated by several feet.
2. Tackboard, 8 linear feet.
3. Chalkboard, 16 linear feet.
4. Washdown floor.
5. Standard interior door.
6. Double opening, double width, exterior door, 7′ high.
7. Skylight or high-entry light source recommended.
8. Locked wall storage cabinets for hand tools.
9. Welding booths (fixed or movable) for three torches with appropriate gas outlets.
10. Forced ventilation required for general high level dust condition and for welding.
11. Large project floor display area, 120 sq. ft.
12. Convenience outlets along walls on 8 foot center.
13. Small project shelf display and/or display case.
14. Heavy-duty wall shelves for large project storage, 24″ x 50 linear feet on 2 foot spacing.
15. 3 garbage cans.
16. Locker dressing area with shower.
17. General supply storage.
18. Heavy delivery areas, 100 sq. ft., outside entrance.

Equipment and Furniture, Movable

1. 20 adjustable, movable sculpture pedestals.
2. Three units, acetylene welding and arc welder.
3. 20 art stools.
4. Saws, hammers, chizels and large assortment of other hand tools.

Three-Dimensional Art Studio

It is recommended that one studio be provided. This space will require 1,000 square feet of assignable area and should be designed to accommodate 24 students. This space is intended to be used primarily for the teaching of three-dimensional art, sometimes referred to as arts and crafts. The greater part of the justification for this space will be its very heavy use for course offerings in adult general education. It should be recognized that during unscheduled portions of the day, the space will be used by students for work on regular class projects and for the general perfection of art skills.

Typical student activities include discussing, criticizing, questioning, bending, cutting, shaping, painting, firing, displaying projects, silver soldering, storing materials and tools, washing up and cleaning up materials, tools, and self, buffing and casting, enameling and drilling.

Typical professional activities include lecturing, leading discussions, criticizing, demonstrating tools and use of materials, using chalkboard, evaluating projects, displaying projects, issuing materials and tools and demonstration of art techniques.

The three-dimensional art areas to be taught include jewelry design and construction, enameling, general metal crafts and general wood crafts.

Equipment and Furniture, Built-in

1. Two sinks (with easy-clean traps) with countertop which is acid resistance, sinks several feet apart.
2. 75 linear feet of counter top along three walls, formica:
    a. 35 linear feet of locked cupboard storage beneath.
    b. 30 linear feet of locked cupboard storage above.
    c. Convenience outlets above countertop on 4 foot centers.
    d. Two corner units, bin storage beneath, 9 square feet each.
    e. Four solder tanks in counter with asbestos tops/firebricks.
3. Heavy-duty floor surface.
4. Standard lighting treatment.
5. Standard wall treatment.
6. Standard ceiling treatment.
7. Ventilating hood over sinks and solder tanks.

Equipment and Furniture, Movable

1. 3/8" bandsaw.

2. Four small silver soldering torches.
3. Three buffing wheels, pedestal mounted.
4. One grinding wheel, pedestal mounted.
5. Two enameling ovens.
6. 6 bench vises.
7. One bench drill.
8. One broken arm casting machine.
9. Two 5-drawer metal legal files.
10. Office bookcase
11. Movable demonstration table with storage below, 2½′ x 6′.
12. Six worktables, 3′ x 6′; storage cabinets, standing work height with heat proof and cut proof table tops. Tables to be used in making jewelry and large objects of art.
13. 24 adjustable stools.

Darkroom

It is recommended that one unit be provided which should be self-sufficient. This space will require 200 square feet of assignable area and is intended to be used primarily for two functions:

1. Printmaking/Photo-silk screening. Instruction will utilize four spaces. Discussions, lecture and some demonstration will normally be scheduled in a general classroom. The design phase, including film cutting, film application, screen mounting, etc., normally will be scheduled for the design studio. Film development, washing and drying normally will be scheduled for the darkroom. The production phase of instruction normally will be scheduled in the printmaking press room.

2. Photography. Instruction will utilize three spaces. Discussions, lecture and some demonstration normally will be scheduled in a general classroom. The lab phase, including film and paper development, washing and fixing, will be scheduled in the darkroom. The third phase, including film and paper drying, and possibly paper mounting, will be scheduled in the printmaking press room. It should be recognized that during unscheduled portions of the day the space will be used by students for work on regular class projects and for the general perfection of darkroom skills. A large part of the justification for this space will be its use for course offerings in adult general education.

Typical student activities will include discussing, criticizing, mixing chemical preparations, cooling solutions, warming solutions, using enlarger, developing paper and film, washing paper and film, fixing paper and film, storing materials and solutions and washing up equipment and self.

Typical professional activities will include explaining the use of materials, equipment and chemicals, demonstrating techniques, evaluating student use of equipment, issuing materials and chemicals, and storing materials.

Equipment and Furniture, Built-in

1. Approximately 40 linear feet of 2½′ counter along wall with acid resistant top.
2. Approximately 10 linear feet of 3 foot open-tray sink which is accessible from all sides.
3. Convenience outlets on walls above counter on 4 foot centers.
4. Five each hot and cold water taps suspended above center of open-tray sink.
5. Constant access light trap entrance to darkroom from print-making press room.
6. Temperature control capability within space; air-conditioning desirable.
7. 4 Linear feet of tackboard.
8. Small lockable storage cabinets located beneath entire counter at 1½′depth.
9. Washdown floor with drain.
10. Washdown walls, finished flat white (not black).
11. In addition to the standard lighting treatment, appropriate switchable filter lighting is needed.
12. No windows.
13. Large size lockable wall storage cabinet with shelves for paper storage.

Equipment and Furniture, Movable

1. Tumbler type paper washer.
2. Six to eight photographic enlargers.
3. 30 to 40 assorted size paper trays.
4. 10 assorted film developing tanks.
5. 8 light-tight paper dispensers.

6. 8 electric darkroom timers.
7. One cabinet type film dryer.
8. 8 adjustable height metal stools.

Printmaking Press Room

It is recommended that one space be provided. This space will require 200 square feet of assignable area and is intended to be used primarily in conjunction with the darkroom as an auxiliary space used in the teaching of printmaking/photo-silk screening and in the teaching of photography. It should be recognized that during unscheduled portions of the day the space will be used by students for work on regular class projects and for the general perfection of printmaking and some photographic skills.

Typical student activities will include discussing, criticizing, using printmaking press, drying photographic films and paper, preparing materials and inks, washing up and cleaning up equipment, tools and self.

Typical professional activities will include explaining the use of materials and equipment, demonstrating techniques, evaluating student use of equipment, issuing materials and equipment and storing materials and equipment.

Equipment and Furniture, Built-in

1. Sink and approximately 6 linear feet of countertop.
2. Lockable storage cabinet below countertop.
3. Printmaking press and etching press.
4. Large drum-type photographic paper dryer.
5. 20 linear feet of 16″ wall shelving.
6. Standard lighting treatment.
7. Washable floor.
8. Standard wall treatment.
9. Standard door.
10. Constant access light trap entrance to darkroom from print-making press room.
11. Convenience outlets along walls, 8 foot centers.
12. Forced air removal required for chemical fumes.

Equipment and Furniture, Movable

1. 4′ x 8′ marble covered table.
2. Drying racks for screen prints.

3. Stretcher boards.
4. Cutting table.
5. 4 linear feet of tackboard.

Art Student Locker Area

It is recommended that one space be provided which will require 420 square feet of assignable area. This space is intended for use as an art supply, tools and equipment storage area for student use. Because of the need for storage that students in art programs have, it is necessary to furnish student storage lockers. It is recommended that these student lockers be placed in one central location, apart from instructional rooms. This will allow students to utilize their lockers and to have access to them at all times, without disrupting instructional meetings.

Typical student activities will include storing paints, brushes, paper projects, clay objects, metal objects, books, chemicals, sketch pads, etc.

Equipment and Furniture, Built-in

1. 90 storage lockers. Each locker to be 2½′ x 2½′ x 2½′. Each locker is equipped with one door, lockable by padlock. A continuous heavy-duty shelf should be installed above lockers for storage of materials which are too large for locker storage.
2. Standard lighting treatment.
3. No windows required.
4. Humidity control for protection of art papers and supplies.

Movable equipment should include two large wastepaper disposal units.

Outdoor Patio/Art Garden

This space is intended for use primarily for the following:

1. As an aesthetically attractive outdoor instructional space.
2. As an area set aside at times for relaxation, not only for art students and faculty, but for all students and faculty.
3. As an area for display of outdoor art objects produced by students and faculty.
4. As a transition area or connecting area between the art facilities and other facilities on the campus.

Typical activities will include painting, discussing, evaluating, thinking, smoking, listening, sketching, talking and explaining.

Equipment and Furniture

1. Fountain.
2. Reflection pools.
3. Trees, grass, shrubs, walks.
4. Outdoor benches.
5. Outdoor paper disposal units.
6. Outdoor cigarette disposal units.

Art Building Halls

These hall walls should be equipped for hanging pictures on burlap and/or moulding. Two show-cases for other objects of art.

Art Faculty Offices

Because of the nature of art instruction and the need for constant availability of art faculty to unscheduled use of art labs, it is recommended that the eight faculty offices be located directly adjacent to the specialized art facilities. Two desk spaces and storage cabinets are needed for 4 evening faculty members, two on Monday and Wednesday and two on Tuesday and Thursday. All of these offices are to be equipped as detailed for the offices of the Mathematics Department except instead of chalkboard will be display area for pictures.

The number of eight faculty required for the day class is calculated as follows:

> There are to be 1,881.6 student credit hours of art for the North Campus as shown in Table 14, page 143 of the Report, *Long Range Planning for Seattle Community College,* 1966. If an instructor teaches 12 credit hours with appropriate labs and has an average of 20 students per class, then he will teach 240 student contact hours. 240 divided into 1,881.6 will give 7.84 instructors or a total of 8.

It is strongly recommended that many art exhibition areas and cabinets be located throughout the campus as a stimulation device for campus-wide interest in art. Such areas may be the Library, Student Center and halls of certain other Buildings.

Classroom

One classroom (30) should be designated for art classes along with other subjects. This room should have walls on two sides equipped for hanging pictures, such as burlap, moulding strip and directional lighting. It should be equipped with a 16′ chalkboard.

Summary of Space Requirements

Table 14.1 contains a summary of the facilities needed for art.

Facility Relationships

Figure 14.1 is a diagram of the functional relationships of the facilities required for the art curriculum.

TABLE 14.1

SUMMARY OF ART SPACES NEEDED

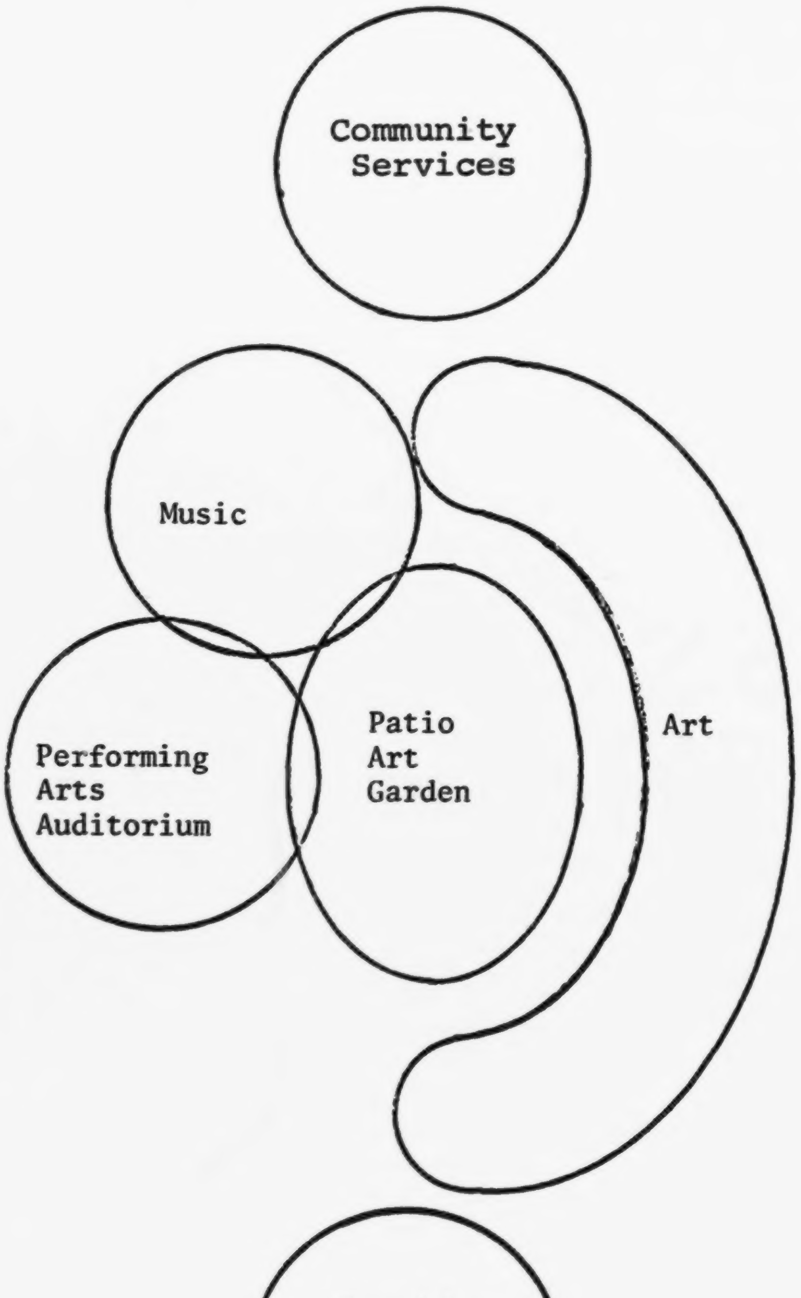
Type of Space	No. of Units	Approx. (Sq. Ft.) Total Space
1. Drawing and Painting Studio	1	1,500
Storage Rooms	2 @ 100 (each end of studio)	200
Sub-Total		1,700
2. Design Studio	1	750
3. Ceramics Studio	1	600
Glazing Room	1	100
Kiln Room	1	100
Dressing Rooms	2 @ 100	200
Cupboard for jars of chemicals with balance	1	50
Cement and Mud Storage	1	150
Sub-Total		1,950
4. Sculpture Studio	1	800
Locker dressing area with showers	2 @ 100	200
General Supply Storage	1	100
Delivery area with outside door for heavy objects	1	100
3-dimensional Art Studio	1	1,000
Darkroom	1	200

TABLE 14.1 (Cont'd)

SUMMARY OF ART SPACES NEEDED

Type of Space	No. of Units	Approx. (Sq. Ft.) Total Space	
Printmaking Press Room	1	200	
Patio-Art Garden	1	Exterior	
Art Studio Locker Area	1	420	
Display Area	1	120	
Division Head Office	1	120	
Faculty Offices	8 @ 80	640	
Evening Art Facility Offices	2 @ 40	80	
Secretary-Waiting Area	1	160	
Classroom	1	480	
Sub-Total		4,620	
Total			8,270

FIGURE 14.1
RELATIONSHIP OF ART WITH NON-ART PROGRAM AREAS


Community Services
Music
Performing Arts Auditorium
Patio Art Garden
Art
Graphics and Mass Media

XV

FACILITIES FOR ELECTRICAL AND ELECTRONICS AND PRE-ENGINEERING

Philosophy and Objectives

Two different but related sets of curricula and their supporting facilities are described in this chapter. First, there is described a cluster of occupational curricula related to electrical and electronics occupations. The purpose of these curricula is to prepare new workers for careers in highly skilled occupations related to electrical and electronics manufacture, construction, maintenance, operation and management. Some of the graduates of these programs will provide important supporting services for natural scientists and engineers; others will be concerned with operational activities in the domain of electrical-electronics occupations; and still others may be associated with technical sales or other aspects of management. And second, there is the group of courses which community college students planning to transfer and study engineering at a four-year institution normally will encounter in the community college, either as a requirement for their ultimate transfer or as enrichment to their early college experience. It is the intent of the college to serve both occupational students and pre-engineering students within this college unit to the mutual benefit of both groups.

Curriculum Descriptions

Curricula Leading to a Certificate

Four electronic curriculums—General Electronics, Industrial Electronics, Airline Electronics and Communications Electronics—will be offered. These curriculums will vary in length but generally will not exceed one school year (nine months). The General Electronics curriculum will generally be a prerequisite to the three specialized electronic curriculums. As many as four electrical certificate curriculums may be offered—Power Generator and Distribution, Electrical Construction, Electro-Mechanical Machine Repair and Service and Appliance Repair. These electrical curriculums will vary in length but generally will not exceed two school years. It is anticipated that these electrical certificate curriculums will be structured in a manner providing a common core of instruction for all entering students with options to the various specialties. A Watch Repair certificate curriculum will be offered. This program will not exceed two school years in length.

A typical day for all electronical and electrical certificate students will be six hours in length with approximately four hours in the shop and two hours in the lab.

Curricula Leading to a Diploma or an Associate in Applied Science

Curricula of six quarters duration which lead to the award of a Diploma or of an Associate in Applied Science Degree are projected to be included among the offerings in Electrical-Electronics. Curriculum options which allow specialization in Electronics-Electrical Drafting, Electrical Power Technology and Electrical Engineering Technology are anticipated. These curricula will include 90 quarter supporting subjects and occupational general education instruction at the post-secondary level.

The typical day will be six hours in length with approximately three hours in laboratory activities and three hours in allied supporting and occupational general education instruction.

Allied Supporting and Occupational General Education courses closely relating to the Associate in Applied Science Degree and Diploma programs of study include:

1. Applied Chemistry
2. Technical Physics
3. Technical Mathematics
4. Communications Skills
5. American Institutions
6. Drafting

Pre-Engineering

The first two years of the baccalaureate engineering program will be available at Seattle Community College to students who elect such studies. Introductory courses in electrical engineering, electronics and electric circuits—all closely articulated with similar offerings at the major neighboring senior institutions—will be offered. Other college areas intimately involved in the curriculum followed by pre-engineering students include the following:

1. Mathematics
2. Chemistry
3. Physics
4. Communications
5. Engineering Drawing
6. Humanities and Social Studies

Teaching and Learning Activities

Instructor Activities

Instructor activities will include lecturing, answering questions, leading discussions, demonstrating devices and instruments, demonstrating problem solving techniques, using visuals and audio-visuals, supervising student performance in the laboratories and shops, preparing instructional materials, giving individual help to students and overseeing sophisticated equipment. Various specialized laboratory and shop areas will be used on a rotation basis employing the equipment and facilities required for the several aspects of the curricula.

Instructors will demonstrate and explain using three dimension (mock-ups and models) and projected aids and the chalkboard. Closed circuit television may be used when appropriate. And when the need for specialized individual instruction is identified, tutorial methods and programmed materials may be used.

Allied Supporting and Occupational General Education subjects for certificate programs may be provided either by the laboratory-shop instructor or by other qualified personnel. Examples of such subjects are mathematics, science, trade theory, blueprint reading, layout and sketching. Allied Supporting and Occupational General Education for certificate programs may be provided separately from the technical instruction or integrated into the technical content of the curriculum.

Allied Supporting and Occupational General Education instruction for Diploma or Associate Degree programs will be provided by qualified and vocationally certificated personnel. These courses may or may not be taught by the technical specialty instructor. When the need for additional developmental instruction is identified, individualized instruction may be used.

Pre-engineering students will follow the traditional college scheduling paradign in enrolling in all subjects taken, specialty subjects and general education alike.

Student Activities

In general, student activities will include listening to lectures, taking notes, participating in discussions, observing demonstrations, visuals and audio-visuals, performing laboratory experiments, working on individual and/or team projects and working with sophisticated equipment. More specifically, the student activities in each of the major curricular areas are as follows:

Basic DC and AC Laboratory—Setup of simple AC and DC circuits on which basic measurements of voltage, current, resistance and phase are made requiring the use of V.T.V.M., V.O.M., oscilloscope, signal generators. Basic soldering and assembly of small electronic equipment.

Electronic Tube and Semiconductor Laboratory—Setup of basic V.T. and transistor amplifier circuits and determination of their characteristics. Use of all basic test equipment, i.e., V.O.M., oscilloscope, signal generators, etc.

Basic Circuits Laboratory—Setup of basic circuit systems including transmitters and receivers. First introduction to troubleshooting procedures. Use of all basic test equipment.

Advanced Circuits Laboratory—Setup of more advanced circuit systems including television, pulse circuits systems and F.M. circuits. Use of more advanced test equipment, i.e., differential type meters, curve tracers, memory scopes, delayed sweep scopes, etc.

Electrical Power Laboratory—Setup, adjustment, repair, control and operation of heavy rotating machinery and its associated control circuits.

Electronic Instrument Laboratory—Testing, calibration, repair, adjustment and use of precision electronic instruments.

Industrial, Avionics and Communications Laboratories—Application of fundamental circuits to specialized systems, i.e., automatic control devices, communications and navigation, broadcast and two-way mobile systems.

Watch Repair Shop—Repair, adjusting, cleaning and calibration of clocks, industrial time mechanisms, watches and other precision regulatory devices.

Electro-Mechanical Shop—Repair of small electro-mechanical machines, i.e., electric office machines, typewriters, vending machines and other electro-mechanical devices.

Appliance Repair Shop—Servicing of electrical appliances or their components. Servicing domestic refrigeration units.

Emerging Concepts and Developing Trends

Several important trends seem to be developing in occupational education in general which have implications for the future in the curricular fields being discussed here.

First, professional engineering education is rapidly adopting a science orientation, with emphasis given to mathematical models and other abstractions. Concurrently, less emphasis is being given to the study of engineering operations. This approach is necessitated by the pace of technological innovation occurring in contemporary engineering enterprise. Engineering education is, in fact, vacating the baccalaureate level in favor of advanced degrees. Such a vertical extension of many professional engineering education programs leaves unsatisfied the educational needs of a broad band of operations-oriented technological manpower. It will be the function of two-year associate degree programs in engineering technology to fill the gap being created. This is widely recognized by federal agencies, educators and employers alike. Community colleges will be called upon more and more to supply engineering-related education at the associate degree level. The greatest foreseeable expansion in community college activity will possibly occur in this area.

Second, educational institutions are rapidly abandoning single-teacher concepts of vocational education in favor of a team concept of teaching. These institutions are finding that the extent of expertise of any one individual is necessarily circumscribed and, hence, that more effective learning occurs when students are exposed to the viewpoints, experience, insights and perceptions of many specialists rather than one.

Third, because the demands on the resources of educational institutions are so broad and because the needs of any one individual—student or employer—are so discrete, it is rapidly becoming impractical to attempt to meet training needs of high degrees of specificity. Rather, schools must provide an educational experience which is versatile and generalizable. Employers are willing to assume responsibility for certain amounts of specific training; schools can best provide the fundamental, generalizable knowledge and skills which are applicable to clusters of occupations.

Fourth, students are being given more responsibility for their own education. Not only are students capable of learning on their own but the learning accomplished is often superior to that which is totally directed and supervised by teachers. Independent study, programmed materials, greater use of library materials and exemption credit by examination are but a few examples of the kinds of techniques by which students can proceed in non-class situations. Recent advances in educational technology, including computer assisted instruction, promise to solidify this trend.

Fifth, experimentation with groups of various sizes indicates that large-group, small-group and tutorial instruction, when used in combination, maximizes the efficacy of collegiate instruction and hence is preferable to any single pattern which might be adopted.

Sixth, the community college—sensitive to the needs of the community it serves—has become aware of the wide spectrum of responsibilities it must assume for occupational education. Continuing education, upgrading education and preparatory education are all vital segments of the total service the college aspires to give to employers, students and employed workers alike. To this end, an appreciable emphasis is given to specialization within certain occupations relevant to contemporary needs of the community.

And finally, in an effort to avoid the emergence of the "two cultures" of which Snow has written, it is desirable that all college students share some educational experiences with other students whose primary interests differ from their own.

Student Groups

Number of Students; Estimates of Clock Hour Usage of Facilities

Data collected on the nature of the community population, the needs of the region for workers in electrical-electronics occupations and the experiences of other colleges in enrolling occupational and pre-engineering students suggest the student populations for this college unit shown in Table 15.1. The instructional staff required by such an enrollment is also

TABLE 15.1

PERSONNEL ASSOCIATED WITH ELECTRICAL-ELECTRONICS CURRICULA AND WITH SECTORS OF THE PRE-ENGINEERING CURRICULUM RELATED TO ELECTRICAL-ELECTRONICS

Area	Projected Student Enrollment	Instructional Staff Requirement
Electrical Certificate Programs	100	4
Electronics Certificate Programs	135	6
Watch Repair Program	20	1
Associate Degree Programs	100	3
Pre-Engineering Program	300[a]	4
Total	655	18

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[a] This is the same enrollment for pre-engineering projected in Chapter XIX.

shown in the table. It is expected that the future development in this college unit will see an increase in the number of students enrolled in associate degree curricula and a corresponding decrease in the numbers enrolled in certificate curricula. The number of pre-engineering students related to this area is expected to remain constant or decrease only slightly.

Certificate students will spend approximately two-thirds of their time per day in laboratory facilities and one-third time in classrooms. Associate degree students, conversely, will spend approximately one-third their time in laboratories and two-thirds in classrooms. The resulting clock hour usage of specialized facilities is projected in Table 15.2 for the enrollments herein assumed.

TABLE 15.2

CLOCK HOUR USAGE OF FACILITIES RELATED TO THE ELECTRICAL-ELECTRONICS AREA AND TO PRE-ENGINEERING

	Total Students	Mean daily Hour per Student in Class	Mean daily Hours per Students in Laboratory	FTE Students in Class	FTE Students in Lab
Certificate Curricula	255	2	4	85	170
Associate Degree Curricula	100	4	2	67	33
Pre-engineering Curricula	300	1[a]	1	60	60
Totals	655			212	263

[a] This figure implies one hour daily use of classrooms in this facility. The students involved will study mathematics, science, communications, etc. in other units.

The implications of Table 15.2 are as follows:

1. During the seven "prime hours" of the school day (8 a.m. to 3 p.m.), 355 occupational students and 300 pre-engineering students will be processed.
2. Approximately 220 student stations in classrooms must be provided.
3. Approximately 300 student stations in laboratories must be provided. (However, due to the specialized nature of some of the laboratories projected for this area, a relatively low utilization factor must be expected). Therefore, student stations somewhat in excess of 300 must be provided in laboratories.

Class Sizes

For laboratory and shop instruction, students will generally be grouped in sections of 20 individuals. Allied Supporting and Occupational General Education classrooms should be able to accommodate as many as 40 students. Pre-engineering students will usually be scheduled in groups of 30. At irregular intervals, there will exist a need for still larger groups of students to meet together. And often, students may work independently or in teams of two or three.

Grouping Techniques and Scheduling Paradigms

Certificate level students in each curriculum will be regrouped at the beginning of each quarter to adjust for advancement to higher levels of instruction, to provide for optimum use of facilities, to compensate for attrition and to accommodate the maximum number of starting students each quarter.

Diploma or Associate in Applied Science Degree. For shop, Allied Supporting and Occupational General Education instruction, students will be grouped according to level of accomplishment, courses completed and common needs. Students will be rescheduled each quarter on the basis of courses satisfactorily completed and courses needed to afford optimum progress in the curriculum and effective use of the facilities and instructional faculty. Schedules for students in these curricula will be formulated on an individual, not a class basis.

Characteristics of Students

It is expected that the students enrolled in these programs will evidence motivation and ability factors higher than the mean of the college. It is planned that selective admissions, counseling and developmental programs will contribute to this effect. Students will generally be high school graduates (primarily male) in the ages ranging from 18 years upward through adulthood. Some students will be employed during the hours they are not attending the college. They will normally be healthy and inclined toward precision manipulative work.

The majority of these students will have verbal aptitudes, as revealed by conventional instruments, near the mean for the college; on the other hand, both the quantitative abilities and the abilities to visualize spatially will be appreciably more highly developed in these individuals.

Faculty and Staff

Table 15.1 showed the number of faculty members projected to be associated with electrical-electronics curricula and pre-engineering. It is suggested that, in addition to the 15 faculty members previously listed, there also will be a need for one administrator (program director), one stenographer, one stock-room attendant/maintenance person and twelve evening school faculty members. These estimates are summarized in Table 15.3.

TABLE 15.3

FACULTY AND STAFF MEMBERS ASSOCIATED WITH ELECTRICAL-ELECTONICS CURRICULA AND WITH PRE-ENGINEERING

Staff Person	Number
Program Director	1
Day Instructors	18
Part-time Instructors	12
Stock-room Attendant	1
Secretary	1
Total	33

The implications of the projections in Table 15.3 are that spaces for the following should be provided:

1	Administrative Office	150 sq. ft.
1	Reception Area	120 sq. ft.
18	Faculty Offices ea. 80 sq. ft.	1,440 sq. ft.
12	Evening Staff Spaces ea. 20 sq. ft.	240 sq. ft.
1	Work Space in Stock Room for Attendant	80 sq. ft.
	Total	2,030 sq. ft.

Services, Utilities and Environmental Conditions

The following requirements are common to all laboratory areas, except as noted:

1. Single phase, three wire, 120 volt, 60 cycle AC current will be needed.
2. Electric supply should be available in the benches.
3. Compressed air is to be dropped where required from overhead manifolds fed from compressor and tank.

4. Minimum of six feet aisle space between all laboratory benches to permit carts to be rolled.
5. Sixty (60) foot candles of illumination at bench level.
6. Each work station to have minimum of 3 ft. x 8 ft. bench (two students) space with suitable stools for seating and adequate storage (drawers and shelf space).
7. Provision for built-in panel meters, power supplies in channels in front of each station, with plug molds along bench tops.
8. Laboratory area to be air conditioned.
9. Lock type locker spaces for student use of approximately 6 cu. ft. each.
10. Separate storage area for laboratory equipment and materials (test equipment and student lab equipment) of approximately 75 cu. ft. per lab station.
11. Demonstration area with chalkboard and similar type bench facilities for instructor use.
12. Each laboratory should be equipped with a master switch to deactivate all electric service to the benches.
13. Entry doors to laboratories must be extra wide, in general; double 3 ft. doors are recommended.

Specialized Spaces Needed to Implement the Instructional Program

The specialized spaces needed to implement the instructional program in electrical-electronics include the following:

1. Basic DC and AC Laboratory
2. Electron Tube and Semiconductor Laboratory
3. Basic Circuits Laboratory
4. Advanced Circuits Laboratory
5. Industrial Electronics and Avionics Laboratory
6. Communications Laboratory with Screen Room
7. Electric Power Laboratory
8. Electronic Instruments Laboratory with Clean Room
9. Watch Repair Shop
10. Appliance Shop
11. Electro-Mechanical Shop
12. Stock Room

13. Work Shop
14. Engineering Drawing Laboratory
15. Technical Reference Room

Figure 15.1 displays these specialized areas along with the other spaces recommended for this college unit. Table 15.4 summarizes the characteristics of these spaces. Subsequent paragraphs describe special aspects of each space.

TABLE 15.4

CHARACTERISTICS OF SPACES ASSOCIATED WITH ELECTRICAL-ELECTRONICS AND PRE-ENGINEERING

Code	Space Description	Student Stations	Instructor Stations	Approximate Area (sq. ft.)
A.	Basic D.C., A.C. Laboratory	65	3	4,000
B.	Electron Tube and Semi Conductor Lab	24	1	2,000
C.	Basic Circuits Lab[a]	24	1	2,000
D.	Advanced Circuits Laboratory	40	2	2,640
E.	Stock Room	—	—	800
F.	Industrial Electronics and Avionics Lab	40	2	2,640
G.	Communications Lab	20	1	1,800
H.	Electric Power Lab	20	1	2,000
	With Remote M-G Set	—	—	250
I.	Electronic Instruments Lab	20	1	1,500
	With Clean Room	10	—	500
J.	Watch Repair Shop	25	1	1,000
K.	Appliance Repair Shop[a]	20	1	1,800
L.	Electro-Mechanical Shop	20	1	1,000
M.	Work Shop	—	—	200
N.	Engineering Drawing Lab	90	3	4,800
O.	Technical Reference Room	——	—	150
	Total	418		29,080

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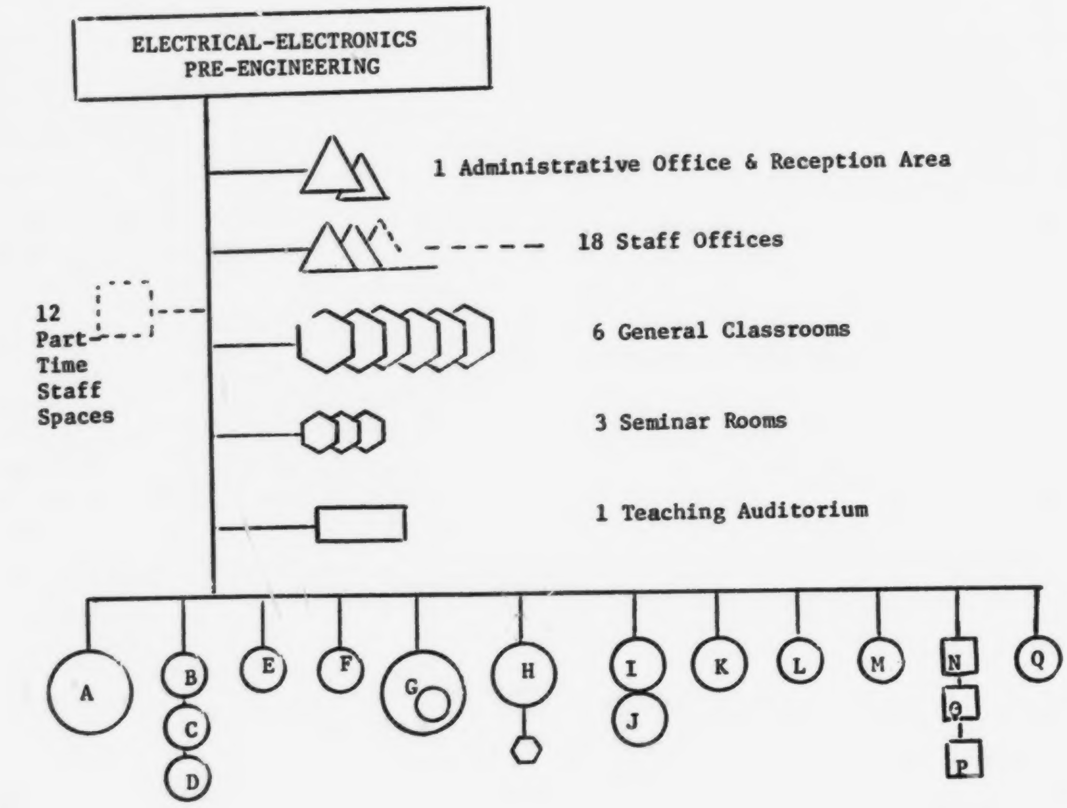
[a] Because of its highly specialized nature, this facility will have a low utilization; it may be vacant part of the year.

FIGURE 15.1

SPACES NEEDED TO IMPLEMENT THE INSTRUCTIONAL PROGRAM IN ELECTRICAL- ELECTRONICS AND PRE-ENGINEERING


ELECTRICAL-ELECTRONICS
PRE-ENGINEERING
1 Administrative Office & Reception Area
18 Staff Offices
12 Part Time Staff Spaces
6 General Classrooms
3 Seminar Rooms
1 Teaching Auditorium
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q

A. Basic DC, AC laboratory
B. Electron Tube and semiconductor laboratory
C. Basic circuits Laboratory
D. Advanced circuits Laboratory
E. Suppy and storage area
F. Industrial electronics and Avionics Laboratory
G. Communications Laboratory
H. Electrical power Laboratory, MG Set
I. Electronic instrument Laboratory with clean room
J. Watch repair shop
K. Appliance repair shop
L. Electro-mechanical shop
M. Work shop
N., O., P. Engineering drawing Laboratory
Q. Technical Reference Room

A. Basic DC, AC Laboratory—Sixty-five student stations are recommended. It is suggested that these be provided in modules of 15, 20 and 30; movable partition walls should be provided so that various combinations of stations can be effected. See Appendix A for an equipment list.

B. Electron Tube and Semiconductor Laboratory — Twenty-four student stations are provided. See Appendix A for an equipment list.

C. Basic Circuits Laboratory — An equipment list to provide 24 student stations is listed in Appendix A.

400 cycle, single phase, 15 amp power should be supplied to all bench positions.

Two nonmetallic-type ducts of approximately 4 in. diameter should lead to the roof area for connecting wires to roof from lab area.

D. Advanced Circuits Laboratory — Equipment needed to provide 40 student stations is listed in Appendix A.

The lab should have 400 cycle, single phase, 15 amp supply to all bench positions.

Two nonmetallic-type ducts of approximately 4 in. diameter should lead to the roof area for connecting wires to roof from lab area.

E. Stock Room—This space should be closely related to laboratories A, B, C and D, and readily accessible to other areas. Shelving and drawer space must be provided. A check-out counter is required. This room must be secured adequately. The attendant's office should be close by.

F. Industrial Electronics and Avionics Laboratory — Appendix A contains an equipment list.

400 cycle, single phase, 15 amp service should be supplied to all student stations.

Three phase, four wire, 15 amp, 120 volt service should be supplied to all positions.

G. Communications Laboratory with Screen Room — Equipment needed to provide 20 student stations is listed in Appendix A.

Power requirements are as follows:

1. 400 cycle, three phase supply in room
2. single phase to benches
3. three phase, four wire, 15 amp, 120 volt to all bench positions

4. audio circuitry, three pair shielded to all bench positions

A screen room of approximately 12 ft. x 18 ft., with easy access to the laboratory should be located in the area. The door opening to allow passage of equipment into this room is four feet wide. The screening must produce RF attenuation of 50 db. in frequency range of 100 mc. Two ten-foot benches are needed to support equipment; these benches must be wired for single phase and three phase sources.

All power sources are to be suitably filtered.

A 10 k.w. television transmitter is to be located in laboratory area.

H. Electric Power Laboratory — The equipment needed to provide 20 student stations is listed in Appendix A.

Both single phase and three phase (120-208 volt, 1,000 amp) service must be supplied to the power panel.

Areas are needed to mount large rotating type machinery (up to 20 h.p.).

A power distribution panel is to be installed in end of room with easy access front and rear. This panel is approximately 6 ft. x 20 ft. in dimensions and requires a minimum of 5 ft. rear clearance.

A motor-generator set to supply power for this and other labs should be remotely located. Noise suppression and vibration reduction are important factors to consider.

I. Electronics Instruments Laboratory with Clean Room — Equipment needed to provide 20 student stations is listed in Appendix A.

Three phase, 120 volt, 60 cycle AC and three phase, 20 volt, 400 cycle AC should be supplied to all benches.

Included in this facility is a clean room (500 sq. ft.) which includes an area for a small standards laboratory having student bench positions within this clean room area; these are in addition to benches in the laboratory proper. Dust filters must be supplied on air intakes to this space.

J. Watch Repair Shop — See Appendix A for an equipment list.

K. Appliance Repair Shop — Equipment needs for 20 student stations are listed in Appendix A.

Three phase, 120-208, 60 cycle AC, (commercial), hot and cold water and sewer connections must be available to all work stations. The facility should contain a 10 ft. x 10 ft. paint booth with ventilation fans.

L. Electromechanical Shop — An equipment list appears in Appendix A.

Three phase, 120-208, 60 cycle AC should be available to at least five of the twenty student stations.

M. Work Shop — This facility is for the production of instructional materials and for minor repair of equipment. A small complement of shop tools should be provided.

N., O., P. Engineering Drawing Laboratories — These areas are each to contain 30 2′ x 3′-drawing tables and stools. Eighty foot candles of color corrected illumination are to be provided at table height. A 4′ x 16′ counter should be provided in the room. Provision for in-room TV and full RAMP services should be made. Chalkboard and corkboard are required.

Q. Technical Reference Room — This space is to contain a small collection of references related to this occupational area. It should be located near the reception area in order that the collection can be monitored by the secretary.

General Classrooms—These spaces should contain tables and chairs for 30 students, an instructor's station with an overhead projector, chalkboard and corkboard. Each should be equipped for RAMP services. In addition, there should exist near the instructor's station electric service outlets for 120V 60 cycle AC, single phase and three-phase.

Seminar Rooms—These spaces should contain a conference table and 15 student chairs. They should have chalkboard and corkboard and should be equipped for RAMP services.

Space Relationships

The following figures suggest desirable relationships among the spaces associated with electrical-electronic and pre-engineering curricula.

Figure 15.2 shows relationships among the spaces assigned to this college unit. Figure 15.3 shows relationships between the spaces here described and other college units on campus.

FIGURE 15.2

RELATIONSHIPS AMONG SPACES IN ELECTRICAL-ELECTRONICS AND PRE-ENGINEERING

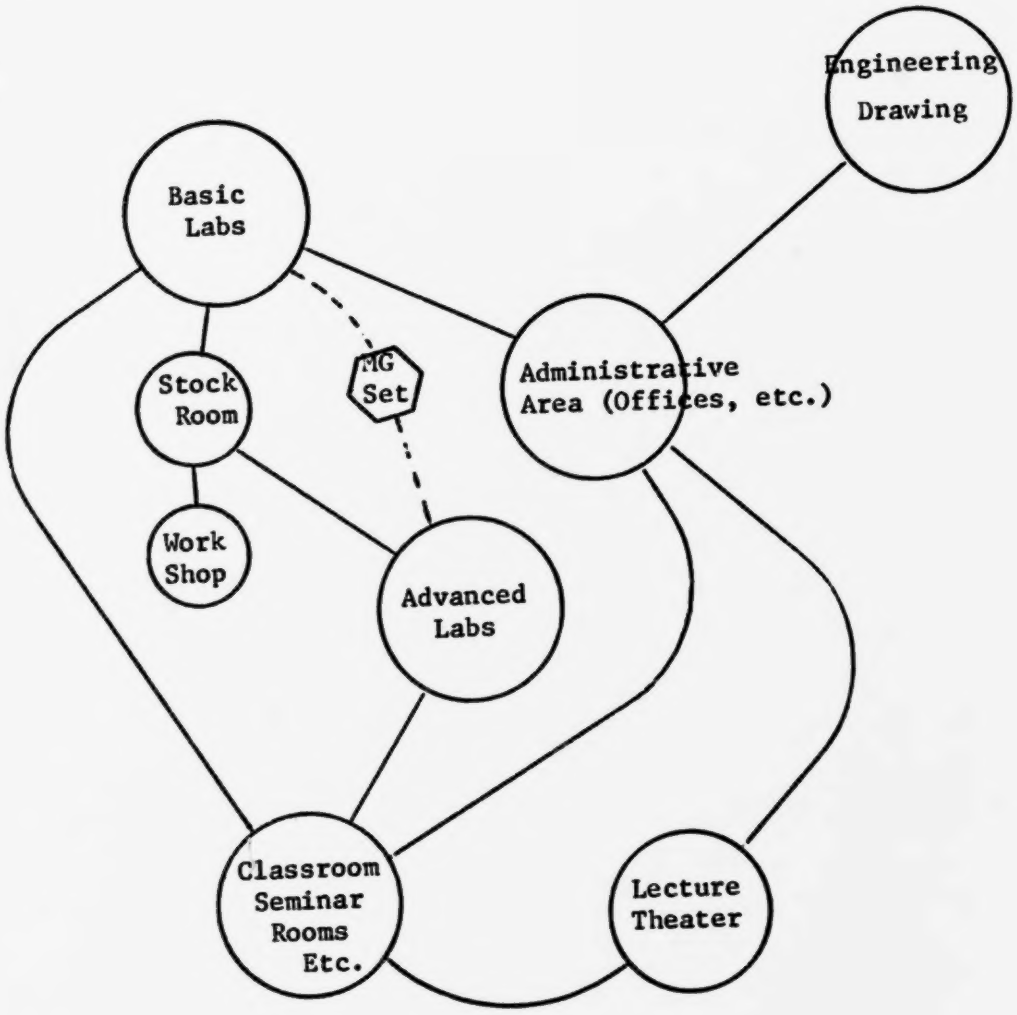
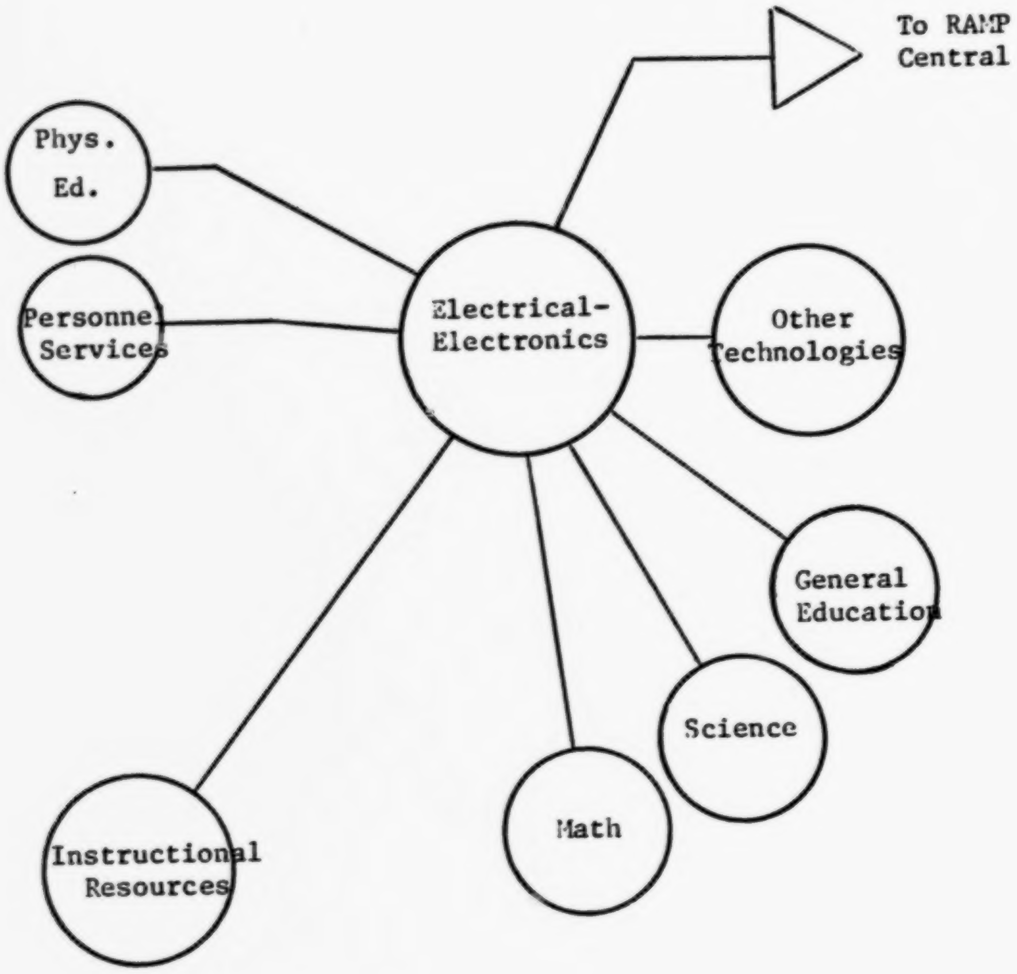

Engineering Drawing
Basic Labs
Stock Room
MG Set
Administrative Area (Offices, etc.)
Work Shop
Advanced Labs
Classroom Seminar Rooms Etc.
Lecture Theater

FIGURE 15.3

RELATIONSHIPS BETWEEN FACILITIES FOR ELECTRICAL-ELECTRONICS AND OTHER FACILITIES ON CAMPUS


To RAMP Central
Phys. Ed.
Personnel Services
Electrical-Electronics
Other Technologies
General Education
Science
Math
Instructional Resources

Non-specialized Spaces Needed by Students in Electrical and Electronics

In addition to the specialized spaces needed to implement the instructional program in their technical specialty, students in the Electrical and Electronics occupational area will be regularly scheduled into a number of other kinds of facilities on campus. The kinds of spaces and the approximate clock hour usage per week projected for these spaces are shown in Table 15.5.

TABLE 15.5

ADDITIONAL SPACES REQUIRED BY ELECTRICAL AND ELECTRONICS STUDENTS

Type of Space	Number of Units[a]	Approximate Usage per Unit in Clock Hours/Week
Physics Classroom	2	3
Physics Laboratory	2	2
Communications Classroom	1	16
Drafting Laboratory	1	12
Engineering Problems Lab.	1	8
Mathematics Classrooms	2	28
Social Studies Classrooms	1	24
Refrigeration Laboratory	1	6
Humanities Classroom	1	3

---

[a] For the purposes of this table, a "unit" is a space which contains more than 20 but fewer than 40 student stations.

Spaces Needed by Pre-Engineering

Pre-engineering students primarily will utilize spaces which have been described in the College Parallel facilities. Provision, however, must be made for spaces to accommodate students as indicated in Table 15.6.

Spaces Infrequently Used by Students in Electrical-Electronics and Pre-engineering

In addition to the spaces into which students in these areas are regularly scheduled, it is projected that occasional demands will be made for additional facilities as indicated in Table 15.7; it is not possible to justify the creation of these spaces for the sole usage of these students but shared usage may be provided.

TABLE 15.6

SPACES NEEDED BY PRE-ENGINEERING STUDENTS

Type of Space	Number of Units[a]	Approximate Usage per Unit in Clock Hours/Week
Communications Classroom	1	30
Social Studies Classroom	1	15
Humanities Classroom	1	15
Mathematics Classroom	1	50
Drafting Laboratory	3	20
Engineering Problems Lab.	1	10
Physics Classroom	1	30
Physics Laboratory	3	10
Chemistry Classroom	1	15
Chemistry Laboratory	2	10
Geodosy Laboratory	1	3

[a] For the purposes of this table, a "unit" is a facility with more than 20 but fewer than 40 student stations.

TABLE 15.7

SPACES OCCASIONALLY NEEDED BY ELECTRICAL AND ELECTRONICS AND PRE-ENGINEERING

Type of Space	Units	Approximate Usage per Unit
Teaching Auditorium for 200 Students	1	3 Periods/Term
Seminar Room for for 15 Students	3	3 Hours/Day

Summary

Table 15.8 gives a summary of all the space needs associated with Electrical and Electronics and with Pre-engineering. Those figures associated with other units of the college and enclosed with parenthesis have *not* been included in the totals shown. The "code" column of the table cites appropriate references.

TABLE 15.8

SUMMARY OF SPACE NEEDS FOR ELECTRICAL AND ELECTRONICS AND PRE-ENGINEERING

Type of Space	Code	No. of units	Student Stas .		Aprox. Area (sq. ft.)	
			Per Unit	Total	Per Unit	Total
Administrative Office	Table 15.3	1	—	—	150	150
Reception Area	Table 15.3	1	—	—	120	120
Faculty Offices	Table 15.3	18	—	—	80	1,440
Part-time Faculty Space	Table 15.3	12	—	—	20	240
Stock-room Attendant	Table 15.3	1	—	—	80	80
Basic DC, AC Lab.	Table 15.4-A	1	—[a]	65	—[a]	4,000
Electron Tube & Semi-Conductor Lab.	Table 15.4-B	1	24	24	2,000	2,000
Basic Circuits Lab.	Table 15.4-C	1	24	24	2,000	2,000
Advanced Circuits Lab.	Table 15.4-D	1	40	40	2,640	2,640
Stock Room	Table 15.4-E	1	—	—	800	800
Ind. Electronics and Avionics Lab.	Table 15.4-F	1	40	40	2,640	2,640
Communications Lab.	Table 15.4-G	1	20	20	1,800	1,800
Electric Power Lab.	Table 15.4-H	1	20	20	2,000	2,000
MG Set	Table 15.4-H	—	—	—	250	250
Electronic Inst. Lab.	Table 15.4-I	1	20	20	1,500	1,500
Clean Room	Table 15.4-I	1	10	10	500	500
Watch Repair Shop	Table 15.4-J	1	25	25	1,000	1,000
Appliance Repair Shop	Table 15.4-K	1	20	20	1,800	1,800
Electro-mechanical Shop	Table 15.4-L	1	20	20	1,000	1,000
Work Shop	Table 15.4-M	1	—	—	200	200
Engineering Drawing Labs.	Table 15.4-N	3	30	90	1,600	4,800
Technical Reference	Table 15.4-O	1	—	—	150	150
General Classrooms	Figure 15.1	6	30	18	600	3.600
Seminar Rooms	Figure 15.1	3	15	45	300	900
Geodesy Laboratory	Chapt. XIX	(1)	(20)	(20)	(600)	(600)
Total						35,610

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[a] This unit is to be separable into three areas with 15, 20 and 30 stations, respectively.

XVI

FACILITIES FOR SCIENCE INSTRUCTION

Philosophy and Objectives

Science is the process by which man attempts to understand and explain the natural phenomena about him, and it includes the accumulation of knowledge resulting from his efforts. During recent years science and its resulting technology have assumed an increasingly vital role in American culture. Because of this role and the unprecedented increase in the rate of expansion of scientific knowledge, new demands have been placed upon science curricula in the schools and colleges.

The science curriculum of the college should recognize the widespread influence that science has on our social, political and economic life, as well as the accelerated rate at which scientific knowledge is accumulating. The need for all citizens to have a background with an understanding of the physical and biological sciences to participate intelligently in American society is apparent. Therefore, science in the community college will always be quantitatively more concerned with the non-science major even though a science major will spend more of his time in the science facilities. A basic objective of the science curriculum is to provide instruction in the traditional lower division science courses for college transfer. Courses offered to meet this objective will serve the science major and should have the rigor of the traditional college level science course.

The community college program also serves students who seek competencies in an occupation which may require two years of formal education, more or less. The science curriculum should provide the service courses needed to meet the needs of students who will be taking a course of study leading to a degree or certificate in the occupational program.

Many adults, for one reason or another, have failed to acquire a high school education and now seek to attain this objective. The science curriculum of the college should provide the science courses and the content to fulfill the needs of adults seeking a high school diploma.

Curricula and Courses

The courses offered will include:

A. Survey-type courses in six science fields and perhaps a seventh as follows:

    1. Physics
    2. Biology
    3. Chemistry
    4. Geology
    5. Astronomy
    6. Oceanography
    7. Physical Science

B. In addition to the survey courses, the offerings will include:
    1. Physics
    2. Biology
    3. Chemistry
    4. Botany
    5. Geology
    6. Zoology

All courses would provide some laboratory experiences with more lab time provided for the more rigorous courses for science majors. Courses for chemistry majors would require as much as two three-hour labs per week. Time in laboratories for physics and biology majors would be four hours per week, perhaps two two-hour lab periods.

Teaching and Learning Activities

Teaching activities will include the following:

1. Demonstrations
2. Lectures
3. Discussion
4. Individual student instruction
5. Presenting visuals
6. Preparing set-ups for experiments and demonstrations
7. Programmed instruction
8. Use of audio-video tapes

Student activities will include:

1. Observing demonstrations that are live, video-taped and telecast
2. Participating in experimentation and analysis
3. Measurement
4. Participating in discussions
5. Taking notes
6. Watching visuals
7. Listening to lectures
8. Viewing microscopes
9. Dissecting animals
10. Using programmed learning materials
11. Observing live specimens

Lectures outside of the laboratory will be conducted for large class groups including several sections of the same course at the same time.

Emerging Concepts and Developing Trends

Some emerging concepts in science instruction of significance are (1) the use of programmed instruction for individual study in selected courses and (2) the integrated approach to instruction in some reorganized science curricula.

Programmed materials are being used to teach the language and technique of science both in general and organic chemistry, botany, general biology and zoology. This approach is likely to be extended to other science curricula in the future.

The audio-tutorial system is an example of an approach being utilized to provide greater emphasis on individual study. This system provides the opportunity for the student to set his own pace and to repeat instructions as needed.

Future curriculum changes could bring about a more integrated approach to science instruction. Curriculum content would be organized differently than the traditional approach.

A significant development is the increasing inter-dependence of the disciplines—physics, chemistry and biology. For example, one new approach to the teaching of biology is from a physical energy standpoint. Consequently, biology students would use equipment common to the teaching of physics to learn this concept. Similarly, a student may be involved in the use of chemistry equipment and materials in a related biology course.

Therefore, teaching a single science course in the future would require the use of facilities now found in all types of science laboratories.

The implications of these trends are (1) that provisions must be made for the eventual use of programmed materials in science instruction areas and (2) that science labs should be planned not only to serve a special course need, but also to permit their interchangeable use among the various science courses. Equipment should be a multi-use type and its installation must permit ease of interchangeability and replacement.

Furthermore, because of the rapid acceleration in the accumulation of knowledge in science, all facilities must be planned with as much vision and foresightedness as current educational patterns will permit. The process of inquiry may change little, but the tools of inquiry will change drastically. The traditional patterns of grouping students are also subject to drastic change. For these reasons the hardware of instruction must be capable of complete interchangeability and replacement with relative ease. Ideally, the development of a lab properly equipped to serve all the science disciplines rather than separate labs for each would be a giant step toward solving the problem of changing interdisciplinary relationships. However, it must be reiterated that current patterns of instruction must be properly served.

Student Groups

Size of laboratory sections should not exceed 32 students with a desirable class size not to exceed 24. Large lecture groups will include several sections of the same course. Laboratory planning should provide student station capacities for 32 students. Large science lecture rooms should provide capacities for approximately 130 students.

In most laboratory situations students will work individually or in groups of two. The students in qualitative, quantitative and organic chemistry courses will work four students per table. In other chemistry courses tables for eight students are satisfactory.

Table 16.1 includes data on the projected number of student clock hours, the estimated number of FTE students and the number of faculty in the science curriculum for the various programs of the college. The estimates are based on the assumption that 3,030 students at the North Campus will be in the college parallel program, 330 in the adult general education program and 1,640 in the occupational education program.

TABLE 16.1

PROJECTED NUMBER OF STUDENT CLOCK HOURS, NUMBER OF FTE STUDENTS AND FACULTY TO BE HOUSED IN SCIENCE FACILITIES

Program and Subject Area	No. of Student Clock Hrs. Per Week	No. of FTE Students	Number of Faculty[a]
Day			
College Parallel Education			
Biology	6,010	375	13.7
Chemistry	3,935	245	8.9
Physics	1,510	94	3.4
Occupational Education			
Biology	700	44	1.6
Chemistry	320	20	.7
Physics	320	20	.7

TABLE 16.1 (Cont'd)

PROJECTED NUMBER OF STUDENT CLOCK HOURS, NUMBER OF FTE STUDENTS AND FACULTY TO BE HOUSED IN SCIENCE FACILITIES

Program and Subject Area	No. of Student Clock Hrs. Per Week	No. of FTE Students	Number of Faculty[a]
Adult General Education			
All Sciences	400	25	.9
Totals	13,195	823	29.9
Part-Time-Evening			
All Curricula	1,440[b]	240[c]	8[d]

[a] A FTE faculty was computed on the basis of 440 student contact hours.

[b] Estimate.

[c] Based on 6 contact hours per week per student.

[d] Assumes 30 students per class group.

TABLE 16.2

NUMBER OF LECTURE AND LABORATORY SPACES NEEDED FOR THE SCIENCE CURRICULUM

Curriculum	Sch/Wk	Ave. Class Size	Class Grps. Per Week	Computed Room Needs[a]	Adjusted Room Needs[b]
Biology					
Lecture	4,473	30	149	4.7	5.55
Lab	2,237	30	75	2.5	3.00
Chemistry					
Lecture	1,593	30	53	1.7	2.00
Lab	2,662	24	111	4.6	5.43
Physics					
Lecture	915	30	31	1.0	1.18
Lab	915	24	38	1.6	1.89
H.S. Science	400	20	20	.8	.95
Totals	13,195	—	477	16.9	Lecture[c] 8.73 Lab 10.32

[a] Lecture rooms were computed on the basis of 40 hours at 80% use or 32 periods per room per week. Laboratories were computed on the basis of 40 hours at 60% use or 24 periods per room per week.

[b] Adjusted room needs equal computed room needs multiplied by 1.18 to allow for 85% student station utilization.

[c] Nine lecture rooms are needed assuming a capacity of 30 student stations in each. A smaller number of larger lecture halls would be required. See list of spaces for adjustments.

Number and Types of Spaces Needed

Table 16.2 includes data on the number of lecture and laboratory spaces needed for the science curriculum.

The following list includes the number, type and approximate size of laboratory and auxiliary spaces needed.

1.	2 General Biology laboratories @ 1,000	2,000
2.	2 General Biology preparation and work rooms @ 300	600
3.	1 Botany-Zoology laboratory	1,200
4.	1 Zoology preparation area	350
5.	1 Botany preparation and storage area	350
6.	1 Physiology and Anatomy laboratory	1,200
7.	1 Physiology and Anatomy preparation area	300
8.	1 Animal area	200
9.	1 Specimen area	200
10.	1 General storage	800
11.	1 Greenhouse	800
12.	3 General Chemistry @ 1,200	3,600
13.	2 Balance spaces for General Chemistry @ 150	300
14.	3 Preparation areas for General Chemistry @ 200	600
15.	1 Qualitative analysis laboratory	1,200
16.	1 Quantitative and Organic laboratory	1,200
17.	1 Organic preparation area	150
18.	1 Quantitative analysis preparation area	150
19.	1 Quantitative analysis/balance area	150
20.	1 Instrument area	300
21.	1 Bulk chemical storage space	600
22.	1 Chemistry stock space	1,500
23.	2 Physics laboratories @ 1,200	2,400
24.	2 Physics preparation and work areas @ 200	400
25.	1 General Physics storage	800
26.	1 Photographic darkroom	200
27.	1 Geology and Astronomy laboratory	1,200
28.	1 Geology preparation area	150
29.	1 Storeroom and lapidary workroom for the Geology lab	450
30.	Science lecture rooms	
	1 General lecture room (seat 130)	1,600

	1 Chemistry lecture room (seat 60)	1,000
	1 Biology lecture room (seat 60)	1,000
	1 Physics lecture room (seat 60)	1,000
31.	3 Work and preparation areas for lecture rooms @ 400	1,200
32.	1 All-purpose science laboratory for high school level curriculum with preparation and work area	1,600
33.	1 Independent science study laboratory for 20 students	1,200
34.	1 Instructor's science project room	2,000
35.	Biology Faculty Offices	
	Chairman's Office @ 120	120
	Secretary & Waiting @ 120	120
	2 Secretaries @ 150	300
	1 Work & Storage @ 300	300
	15 Biology faculty offices @ 80	1,200
	1 conference room	400
36.	Chemistry Faculty Offices	
	Chairman's Office @ 120	120
	Secretary and Waiting @ 120	120
	1 Secretary @ 80	80
	1 Work and Storage @ 200	200
	10 Chemistry faculty offices @ 80	800
	1 conference room	300
37.	Physics Faculty Offices	
	Chairman's office @ 120	120
	Secretary & Waiting @ 120	120
	1 Part-time secretary @ 80	80
	1 Work and storage @ 200	200
	4 Faculty offices @ 80	320
	1 conference room	300
38.	High School Level Sciences Faculty	
	1 Faculty office & Storage @ 120	120
39.	Part-time faculty offices 8 @ 20 sq. ft.	160
	Net Total Square Feet	39,430

Space Descriptions and General Facility Requirements

General

1. Lecture rooms should be windowless to provide complete light control.

2. All lecture and laboratory rooms should be provided with a demonstration desk equipped with hot and cold water, a sink, two gas outlets and 110-V electrical outlets. Room light control should be provided at the demonstration desk for accessibility and ease of control by the instructor. Also, safety cut-off switches for gas and electrical service in the room should be provided at the demonstration desk.
3. Educational television should be readily accessible to all science instruction rooms.
4. A sliding chalkboard with multiple sections should be installed in all labs and lecture rooms at sufficient height above the demonstration desk to present an unobstructed view by seated students. Map rails should be provided above all chalkboards.
5. Provisions should be made for the permanent installation of a pull-down screen for visual projections in all science instruction rooms.
6. A "Pass-through" arrangement should be provided in all labs and lecture rooms between the preparation or storage room and the demonstration desk.
7. Layout and arrangement of laboratories should enhance ease of student supervision and control.
8. Planning should provide visual access to other science areas beyond the immediate laboratory space, yet there is need for acoustical privacy as well.
9. Passing student traffic should have visual access to laboratory activities.
10. Access to laboratory storage areas should make it possible to clear the laboratory for the next class within the shortest possible time.
11. Each laboratory should have an exhibit or display area which can be seen by passing student traffic. Maximum advantage should be taken of this opportunity to place science on display. Perhaps the suggested Marine Aquarium could be highlighted as a feature of the science center.
12. Insofar as is possible, laboratories should be planned to serve more than one science discipline and for change in its use in the future should this be required. A possible exception is Chemistry.
13. Each science lab and lecture room should be provided with at least six lineal feet of tackboard near the entrance of the room.

14. All preparation and work spaces for laboratory and lecture rooms should contain a work counter.

15. All preparation rooms and work spaces for the same science discipline may be combined into one large preparation and work area if an adjacent location can be provided for the laboratories.

16. Where possible, cabinets for science labs should be movable for ease of rearrangement or exchange.

17. Appropriate storage for volatile chemicals used in science instruction should be provided.

18. Automatic washers for glassware should be installed in the chemistry and biology laboratories.

19. Switches for the remote control of projection equipment in science lecture rooms are needed.

20. Each biology and chemistry laboratory will need a refrigerator space, and an electrical outlet should be provided for it, either in the lab or in the preparation room.

21. Each preparation room should have positive mechanical ventilation and have special provision for cleaning floors. A floor drain is desirable.

22. Disposal units should be installed in all work and preparation rooms for biology laboratories.

23. The room air from science labs, particularly that in biology and chemistry, should not be circulated to other rooms in the building. Special attention to mechanical ventilation needs must be provided.

24. Shelving in all storage rooms should be adjustable.

25. Science laboratory and lecture rooms should be provided with RAMP facilities.

26. All science laboratories should be equipped with an in-room closed circuit television system.

27. All chemistry laboratories should have lockable student storage drawers in the student tables. Each student station should accommodate seven lockable student drawers and a cupboard storage space. Stand-up height facilities should be provided.

28. All general biology and zoology laboratories should have a lockable storage cabinet to accommodate 227 dissecting trays. Student work

stations should accommodate a dissecting tray for each student station.

29. Chemistry students will stand at work counters. Others will usually sit while working at student stations.

General Biology Laboratories

Two general biology laboratories should be provided. Each should be designed to accommodate 32 students. Student work tables should accommodate two students each. These should be movable. The student work tables should be one way facing tables and should have 110-volt AC electrical outlets installed in the desk, *not* on top of the desk.

A work counter with cupboard type shelves should be installed along two walls, if possible along opposite walls. Four work sinks should be installed in the work counters, two on each wall. At least two duplex gas outlets should be installed above the counter on each wall. Double AC electrical outlets should be spaced at intervals of four feet along the counter or above the counter on the wall. Adequate enclosed wall storage should also be provided. Lockable storage cabinets adequate to store 32 microscopes should be installed.

An aquarium with a capacity of approximately 50 gallons should be provided in general biology laboratories for the collection and growth of aquatic plants and animals. A marine aquarium with filtered sea water should be installed in one of the laboratories. These should be planned for display purposes as well as for use to keep specimens alive.

Special considerations include the need for mechanical exhaust ventilation above the demonstration desk and floors which are impervious and easily cleaned. If possible, a direct outside exit from the biology suite is desirable. A chemical fire extinguisher should be placed in a convenient location in the biology suite.

General Biology Preparation Rooms

A preparation and work room should be provided for each general laboratory. They should be equipped with a large preparation table with services for water, gas, electricity and waste. Storage cabinets both below and above the preparation table are needed. Special storage cabinets are needed for micro-projectors and other visual aid equipment, slides, and so on. Space for a refrigerator should also be provided. A commercial disposal unit should be installed in this area.

Botany-Zoology Laboratory

This laboratory should be equipped with one-way facing student work tables to accommodate two students each and be movable. A capacity of 32 students will be needed. Each work station should have available gas and AC electrical service. The tops of the counters should be clear of projections, if possible.

Work counters should be installed along opposite walls with two sinks and enclosed cupboard storage underneath in each. A glass display case should be included in one section of this counter. Gas and AC electrical outlets should be available at intervals of 4-6 feet along the counter. Hot and cold running water should be available at the sinks.

The rear wall of the room should provide for the storage of models and microscopes for the student capacity. Thirty-two microscopes will be stored.

Plant Room

A plant room located adjacent to the Botany lab should be provided. This room should have temperature, moisture and light control. Germinating beds should be arranged along the outer wall, and racks for potted plants should be provided. A water spray system is desirable.

Zoology Preparation Room

This room should include a counter with two to four sinks for student use and a larger deeper sink for washing zoological specimens. A large storage cabinet is needed for the storage of wet specimens. A commercial disposal unit should be installed in this area.

Botany Preparation Room

This room should be adjacent to the Botany-Zoology laboratory and should open directly onto it. A work counter with preparation sink installed in it, cupboard storage below and cabinets above should be provided. Hot and cold water, gas and electricity should be provided at the preparation table. At least four herbarium cases should be provided and located in the preparation room. This room in all cases should be separate.

Green House

The green house proposed for Building Construction Technology should be available for use by the Science Division.

Physiology and Anatomy Laboratory

This laboratory should be planned to accommodate 32 students. Four eight-student tables should be provided.

Two student tables should have centrally located sinks and utility services. The other two tables should have end sinks and utility services. Each table should be provided with hot and cold water, gas and electricity. Electrical service outlets should have variable AC and DC voltage and timed impulses. Electrical outlets should supply 0-135 volts AC and ½-24 volts DC. Provision should be made for distilled water in this laboratory.

The demonstration desk should be centrally located within the laboratory. Cabinet storage for models and microscopes are needed. Sixteen microscopes will be stored.

A counter with cupboard storage underneath should be installed along one wall of the laboratory. Electrical outlets spaced four to six feet apart should be installed in this counter.

Physiology and Anatomy Preparation Room

This room should be adjacent to the physiology and anatomy laboratory and should open directly onto it. A counter with wall cabinets above and cupboards underneath should be installed along one wall. A work sink should be installed in this counter. Hot and cold water, gas and electricity should be provided. Compressed air and distilled water should be provided for this space. A kymographic fume hood should be installed in this room. A refrigerator is also needed in this room. Adequate mechanical ventilation is needed.

Animal Room

Laboratory animals will be kept and cared for in this room. A counter with food and litter bins beneath is needed. Food bins should be moisture and rat proof. A large metal sink with hot and cold running water is needed. Approximately ten feet of wall space is needed for animal cages. A steam cleaning line and a waste disposal unit should be provided. A drain in the floor is also needed. Direct access to the Anatomy and Physiology room is desirable. Forced air ventilation should be provided to the outside of the building. This room should be located so that it is convenient to the zoology and general biology laboratories.

Specimen Room

This room should provide for about 15 feet of wall space for stainless steel extremity tanks. Also, storage space should be provided for at least two portable mounted skeltons and eight to ten feet of storage cabinets.

Biology Stock Room (Storage)

This room should be equipped with 24″ shelving running from floor to ceiling, about 15 feet of wall space for animal cages and a work counter with cupboard storage underneath. A sink with hot and cold water is also needed. Several convenience outlets for 110V AC are also needed. Central refrigerated storage should also be provided in this room. Culture incubators for use by all biology classes should be provided. Special storage provisions are needed for radioactive materials.

General Chemistry Laboratories

Three general chemistry laboratories designed to house 32 students each should be planned. Four eight-student laboratory tables equipped with sinks and utilities should be installed. Utilities should include a cold water tap, a gas jet and an AC electrical outlet at each student station. An acid-proof water trough should run the length of the laboratory table and empty into a deep sink at one end of the table. The laboratory tables should contain seven lockable drawers and a cupboard space for each student station. Reagent shelves should be provided above the sink at the laboratory tables or preferably in a side wall cabinet.

A work counter should be installed along a side wall. The top should be of an acid resistant surface. Drawer space approximately 10″ x 12″ x 20″ should be provided underneath the counter. Fume hoods should be installed in this laboratory. Two standard five-foot hoods including services mounted side by side should be adequate. Distilled water should be provided at some central location in the laboratory.

An emergency safety unit should be installed in each chemistry laboratory and should consist of an emergency shower fixture, a floor drain, an emergency eye wash and a chemical fire extinguisher.

Qualitative Analysis Laboratory

This laboratory should be planned exactly as the general chemistry laboratory with the following minor exceptions:

1. Special provisions should be made to directly exhaust the excess toxic (hydrogen sulfide) gases accumulating in this room.
2. Shelves should be installed along one wall for (portable) centrifuges. Electrical outlets are needed at three-foot intervals for the centrifuges.
3. A still of not less than 2½ gallons per hour capacity and a 10-15 gallon copper lined storage tank are needed to provide pure water. This still may serve other areas as well.
4. Laboratory tables should be four student tables.

Quantitative and Organic Laboratory

This laboratory should be planned for both organic chemistry and for general chemistry as well. With minor exceptions, this lab should be planned similar to the general chemistry lab. The laboratory tables and equipment storage should be planned to handle the larger apparatus involved in the advanced courses, but the storage drawers under the side wall counter should be identical to those in the general chemistry laboratories. Lab tables should be four student tables. Two ceramic sinks spaced six feet apart should be located in the counter along the side wall. Provision for two fume hoods with services, a source of distilled water, a safety shower and an eye wash should also be made.

Balance Rooms for Chemistry Laboratories

The balance room for the quantitative laboratory requires relatively vibration-free weighing of samples. Students will be using these rooms for extremely accurate weighing of samples. A shelf 18″ wide should be installed around the perimeter of the room at a height of 36″. Small drawers are needed at each balance station to hold the balance weights. A balance requires an area 24″ long by 18″ wide. This room should be extremely well lighted—65 foot candles or more. Corrosive laboratory vapors should be excluded from this room. Good ventilation is essential.

The other two balance rooms required for general chemistry house less sensitive balances. A rigid counter extending along the perimeter of the room at a height of 36 inches should be satisfactory for all.

Bulk Chemical Storage Room

Chemicals are purchased in large quantities and require central storage until brought into the chemistry stockroom for use. Approximately two-thirds of the space in this room will be devoted to the storage of dry chemicals and should be equipped with adjustable 30″ wood shelves with 18″ vertical spacing. The remaining third should be planned for shelf storage of acids and alkalis in one gallon containers on lower shelves. A water faucet and floor drain in the acid storage area is desirable. A separate means of ventilating this room is a necessity. Service delivery of bulky items is essential. Both volatile and corrosive chemicals will be stored in this area.

The Chemistry Stockroom

The stockroom should serve the following functions:

A. Preparation and weighing of solutions for all chemistry labs (150 sq. ft.)

B. A work area for assembly and preparation of apparatus (100 sq. ft.)

C. A storage and dispensing area (750 sq. ft.)

The preparation and weighing area should have a large ceramic sink (2′ x 3′) with hot and cold water, 110V AC electrical outlets and a 4′ counter on each side of the sink. A source of distilled water is needed at this sink. The remaining wall space in this area should be equipped with adjustable 8″ shelving. A floor drain is needed in this area. A fixed fume hood should be installed over the sink and a part of the work table where solutions are to be prepared.

The work area needed for assembly and repair of apparatus should be equipped with a small work bench for glass blowing equipment. Space for several small (2′ by 3′) trucks used to carry materials to the labs should be provided.

The storage and dispensing area will be used for the storage of currently used chemicals and equipment. A 2′ counter should extend along the wall adjacent to the dispensing window which can be closed and locked. Cabinet storage should be provided below the counter with adjustable shelves for storage of costly equipment. Adjustable shelving from floor to ceiling should be provided in the rest of the space. 24″ shelving spaced 14″ vertically and extending from floor to ceiling should be provided. Only minimum aisle widths need to be maintained.

Physics Laboratories

Two labs should be planned with capacities of 32 students each. Two student tables should be one way facing tables and should be serviced for AC-DC electricity and gas. Provision should be made for mounting apparatus on vertical supports at the student stations. Similarly, provision should be made on walls and at ceilings for mounting barometers, thermometers and other apparatus in convenient locations. Work counters should be installed on opposite walls and should have a cold water supply and sinks installed.

Physics Preparation Areas

These areas should be adjacent to the physics laboratories and should open directly onto them. A work counter with wall cabinets above and cupboards underneath is needed. A work sink should be installed in the counter. Water, compressed air, gas and electricity should be provided. The electrical panel with AC-DC voltage should be installed in this room. Adjustable 10″ shelving should be installed in this area.

Photographic Darkroom

A darkroom is needed adjacent to or as a part of one physics laboratory. The room should have a counter, a small sink and several 110V AC electrical outlets. Provision should be made for a light tight door, safe lights and adequate ventilation. The counter will provide space for an enlarger, a printer and solution trays and cabinet storage underneath.

Physics Storeroom

This room is to be used exclusively for the storage of physics apparatus of varying sizes. Floor to ceiling shelves and wall cabinets of varying widths and vertical spacing are needed. Aisle widths should accommodate apparatus carts. Dutch door arrangement would facilitate the handling of equipment.

Geology Laboratory

This lab should be equipped for 32 students. Eight four-student tables equipped with AC electrical and gas outlets at student stations should be provided.

A counter with cupboard space underneath should be provided along a side wall. Two sinks equipped with sediment traps and cold and hot water should be installed at opposite ends of the counter. The counter should also be equipped with gas and electrical outlets spaced at 4-6′ intervals.

A storage cabinet to store specimen kits should be provided. Seventy-two openings should be provided.

One wall of the laboratory should be equipped with cabinets with glass doors for the storage and display of specimens.

Geology Storeroom and Lapidary Room

This room should serve as a storeroom and as a workroom for cutting and polishing stones. Cabinets from floor to ceiling should be installed on one wall of this room. A work counter with sink should be installed on a second wall. Sound isolation is needed.

Science Lecture Rooms

Four science lecture rooms are needed. One should be planned to seat approximately 130 students, and the other three should seat approximately 60 students. These rooms should be windowless to reduce exterior noise and to provide optimum light control for using visual aids.

Seating arrangements should provide for elevated seats in tiered sections which provide a clear view of the top of the demonstration desk. Room acoustics should accommodate the instructor's voice without sound amplification. Sound amplification should be provided in these rooms. RAMP facilities should be provided.

Shapes of rooms should be determined by appropriate sight lines and viewing angles as well as the need for the student to be as close to the instructor's desk as possible. At least four 110V AC electrical wall outlets should be installed, one each at the front, back and two side walls.

Provision should be made for the use of portable fume hood equipment in the lecture rooms. Compressed air should also be available at the demonstration desk in addition to the utilities services already outlined.

Preparation rooms and storage space should be integral components of the lecture rooms. The preparation rooms should contain floor to ceiling open shelves, a preparation table supplied with water, gas, electricity and compressed air should be installed in the preparation room.

All-Purpose Science Laboratory

This laboratory should be planned to accommodate 32 students at 8 four-student tables. Student tables should have 110V AC electrical outlets, sink and cold water, gas and compressed air available to each student station.

A counter with cabinets below should be installed along one wall as a work and storage area. Two sinks should be installed in this counter and cold water and waste lines supplied to these sinks.

Student tables should be equipped with drawers—one for each student station period. Storage cabinets and display cases should also be provided. Provision should be made for the use of a portable fume hood at the demonstration desk.

Science Courtyard

A landscaped patio-like area should be planned as a science courtyard. A weather station, a telescope, a fish pond and fountain and a small botanical garden are suggested items for inclusion in this area. A space age, botanical or astronomy theme might be chosen.

Independent Science Study Laboratory

This laboratory should serve students who are capable of independent study under minimum supervision; it should be equipped with 20 study carrels and ten work lab stations. Laboratory work stations should be installed along the periphery of the room and equipped with sink, water, gas, AC-DC electricity and compressed air. Drawer space should be provided in the work table for as many students as possible.

The independent study carrels should have provisions for film and film clips, audio tape playback, closed circuit TV reception and an audio system. An emergency signaling system should be installed with connections to the division secretarial area.

Storage facilities should include space for storing apparatus carts with experiments and individual projects of students. The experiment carts will be wheeled from the storage area to the work station for service and utilities, and experiments will be set up on the cart and conducted at the work station.

The location and arrangement of this space should permit expansion of the stations devoted to independent study. This is a "high visibility area."

Instructor's Project Room (Workshop)

This facility should provide both the space and equipment necessary for science instructors to:

1. Set up equipment they will use which requires permanent installation.
2. Set up equipment for experiments requiring temporary installation.
3. Use in making trial demonstrations.
4. Build mock-ups, demonstration panels and instructional aids, models and devices.
5. Test and repair equipment, instructional aids and devices.

The workshop should contain three types of space: (1) a workshop area where tools, equipment and materials are stored and used for building instructional aids and devices and for repairing same. Large equipment should include a band saw, a bench saw and a small planer; (2) a space for 22 faculty "experimental" or "research" stations which should include work counter space with work sink and utilities such as gas, water, electricity (variable voltage) and compressed air; (3) an enclosed area housing two fume hoods, chemical storage cabinets and shelves and work counter space with work sinks and cabinets underneath. An emergency station is desirable.

Specimen Pond

A small lake or pond, if available on the site, would provide the opportunity for biology students to gather samples for analysis. This pond or lake could be an integral part of the landscaping of the campus or part of the wild area.

Faculty Offices (80 sq. ft.)

Faculty members will read, write, prepare the class demonstrations, compile grades, file records and reports, counsel students and confer with other faculty members in their offices.

Each faculty member is to have a private office of approximately 80 square feet net. Each office should be carpeted.

Each office should be furnished and equipped with a double pedestal desk, an office chair, two side chairs, a five-drawer legal size filing cabinet, a bookcase 3′ wide. Each office should be equipped with a telephone outlet and one or more electrical duplex outlets. Closed circuit television capability should be provided for this area.

Department Chairmen's Office (120 sq. ft.)

The chairmen or heads of departments are to have private offices of 120 square feet each. Each office is to be equipped as detailed for the regular faculty offices. Each of these offices should have a telephone.

Secretaries' Office and Waiting Room

This space should be equipped with secretarial desks and chairs, a chalkboard, a work table, filing cabinets, electrical outlets and a telephone. Also a small lounge and two side chairs, a lamp table and lamp and ash trays should be provided. The emergency signaling system from the independent study laboratory should be installed in this room for emergencies. A browsing area for instructional materials should be provided in this area.

Department Work and Storage Room

This room is to be equipped with a work counter and sink with cupboards above and below the counter for the storage of office supplies, etc. A ditto machine and a photocopy machine will be housed in this space. Space for several filing cabinets should be provided.

Conference Rooms

These rooms should be equipped with a conference table to seat a maximum of 16 people. Sixteen upholstered chairs should be provided.

A television monitor, a chalkboard, a tackboard and a movie screen fixed to the wall should also be installed in the conference room. These rooms should be carpeted.

Space Relationships

The following comments with regard to facility locations and relationships are made:

1. All science facilities should be located in close proximity to each other, perhaps in a single science building.
2. Science instructors' offices should be located in close proximity to the science laboratories.
3. The lecture, laboratory and storage areas of a science discipline should be considered as a unit and be located on the same level and in the same general area.
4. Science facilities should be located as close as possible to facilities for technical education.
5. Work, instrument and preparation rooms serving a laboratory should be located adjacent to it.
6. Science facilities should be located adjacent to a wild area for outdoor science instruction.
7. The science center should be in close proximity to the Instructional Resources Center and to classroom buildings.
8. Because of various functional considerations and administrative conveniences, the science areas appear to divide themselves naturally into four major functional components: physics, chemistry, biological sciences and core (common) services. It is critical, however, that it be understood that there is no clear line of separation between any two of these functions. For this reason, it is essential that the architecture for the science facilities express the growing unity of the sciences. Presently, the more important relationships are between physics and chemistry, between chemistry and biological sciences and between the core services and the three science areas.

Figures 16.1, 16.2 and 16.3 are diagrams of general facility and intra-unit relationships.

FIGURE 16.1

GENERAL RELATIONSHIP OF SCIENCE FACILITIES, NORTH CAMPUS, SEATTLE COMMUNITY COLLEGE

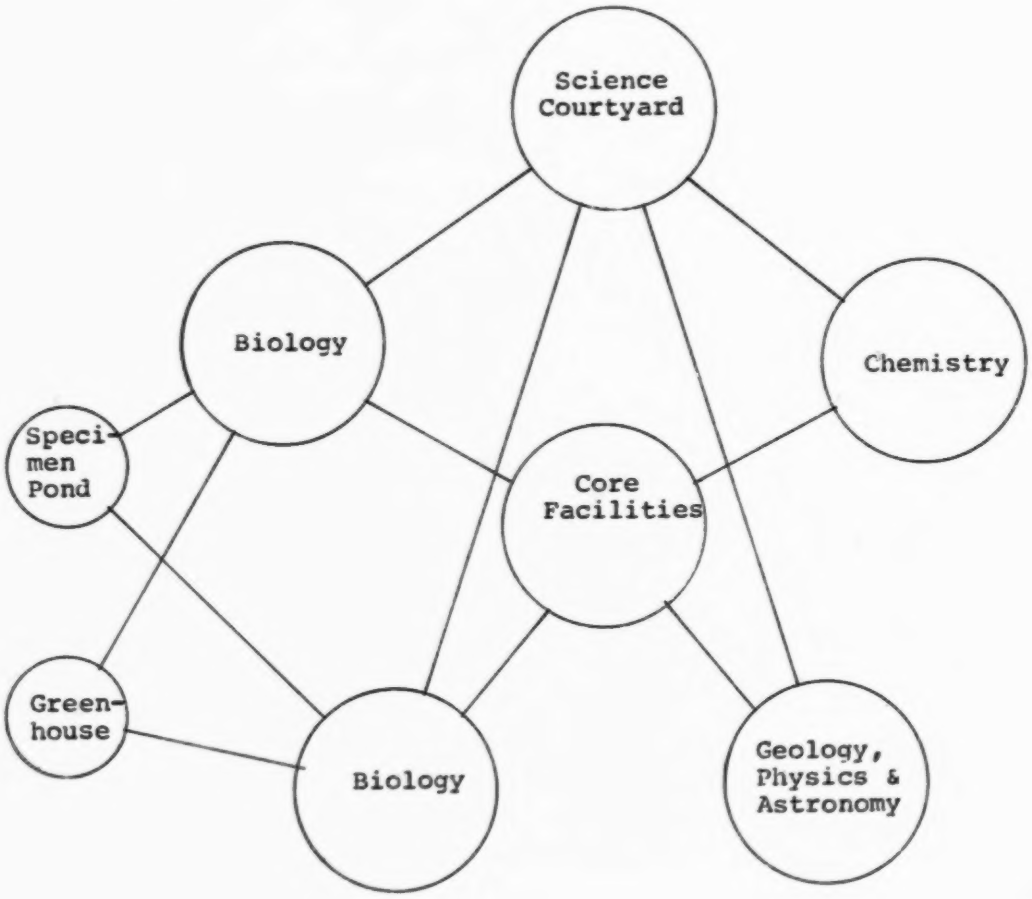

Science Courtyard
Biology
Chemistry
Specimen Pond
Core Facilities
Greenhouse
Biology
Geology, Physics & Astronomy

FIGURE 16.2

UNIT RELATIONSHIPS OF SCIENCE FACILITIES FOR THE NORTH CAMPUS OF SEATTLE COMMUNITY COLLEGE

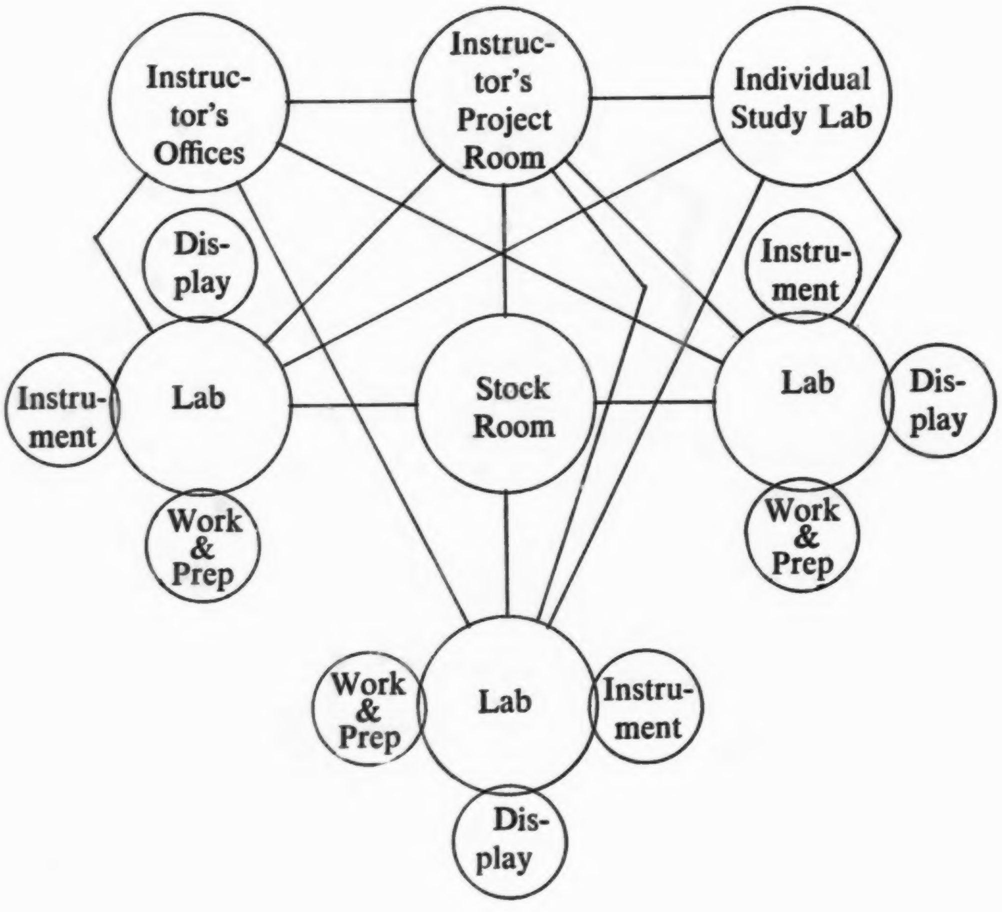
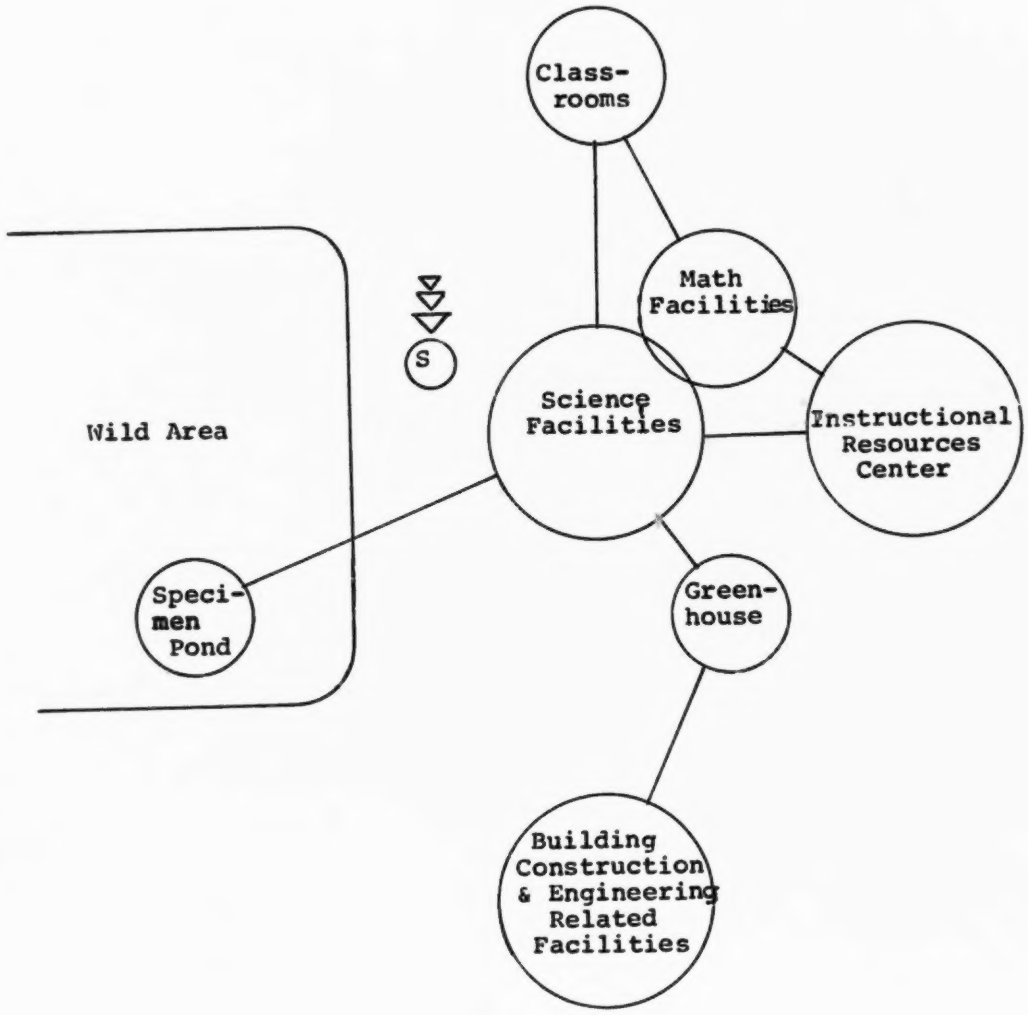

Instructor's Offices
Instructor's Project Room
Individual Study Lab
Display
Instrument
Lab
Instrument
Stock Room
Lab
Display
Work & Prep
Work & Prep
Work & Prep
Lab
Instrument
Display

FIGURE 16.3

RELATIONSHIPS OF SCIENCE FACILITIES TO OTHER CAMPUS FUNCTIONS AND SERVICES OF THE NORTH CAMPUS, SEATTLE COMMUNITY COLLEGE


Class-rooms
Math Facilities
S
Science Facilities
Instructional Resources Center
Wild Area
Speci-men Pond
Green-house
Building Construction & Engineering Related Facilities

XVII

FACILITIES FOR BUSINESS, COMMERCE AND BUSINESS ADMINISTRATION

Philosophy and Objectives

Several of the educational programs to be implemented at Seattle Community College have elements of communality, in that they all are related in their preparation for careers in business or commercial enterprise. For this reason, the educational specifications for the facilities needed to implement these programs have been grouped together in this document. It is suggested that a physical grouping of these same facilities be made on the college campus.

The instructional programs included in this unit are:

College Parallel courses in Business Administration and the following occupational programs:

Office Occupations and Secretarial Science
Business Management, Accounting and Finance
Data Processing
Marketing and Distribution

These five sets of different but related sets of curricula and their supporting facilities are described in this chapter. First, there is the group of courses which community college students planning to transfer and study business administration at a four-year institution normally will encounter in the community college, either as a requirement for their ultimate transfer or as enrichment to their early college experience. And second, there is described a cluster of occupational curricula related to the four business occupational areas previously mentioned. Some of the graduates of these programs will provide important supporting services for the data processing engineers; others will be concerned with operational activities as typists, stenographers and accounting machine operators. Still others will be associated with retail and wholesale selling, management, bookkeeping and secretarial occupations. Finally, others will be associated with insurance and real estate management and selling. It is the intent of the college to serve both occupational students and college-parallel students within this college unit to the mutual benefit of both groups.

Curriculum Descriptions

Curriculum Leading to an Associate in Arts Degree

Course requirements for the first two years of study leading to a Baccalaureate Business Program will be available at Seattle Community College to students who elect such studies. Introductory courses in business—all closely articulated with similar offerings at the major neighboring senior institutions—will be offered. Other college areas intimately involved in the curriculum followed by pre-business students include the following:

1. Communications
2. American Institutions
3. Psychology
4. Biological or Physical Science
5. Philosophy
6. History

The Business administration and secretarial science courses offered for the college parallel student may include the following:

1. Principles of Accounting
2. Secretarial Science
3. Introduction to Business
4. Business Correspondence
5. Business Law
6. Statistical Analysis
7. Typing
8. Shorthand
9. Secretarial Practice

Curricula Leading to a Certificate

Business curricula—such as clerical, stenographic, accounting machines, bookkeeping, and marketing and retail selling—will be offered. These curricula will vary in length but generally will not exceed one school year (nine months).

A typical day for all business certificate students will be six hours in length with approximately four hours in the lab or other specialized area and two hours in general classrooms.

Curricula Leading to a Diploma or an Associate in Applied Science

Curricula of six quarters duration which lead to the award of a Diploma or of an Associate in Applied Science Degree are projected to be included among the offerings in Business and Commerce. Curricula anticipated at the present time include:

- Accounting and Finance
- Data Processing
- Real Estate
- Secretarial Science
- Stenography
- Bookkeeping
- Insurance Risk Management
- Retail Selling
- Office Management

These curricula will include 90 quarter hour credits in technical specialty subjects, allied supporting subjects and occupational general education instruction at the post-secondary and/or college level. The typical day will be six hours in length with approximately three hours in laboratory activities and three hours in allied supporting and occupational general education instruction which can be accommodated in general classrooms.

Emerging Concepts and Developing Trends

Technological advances are beginning to revolutionize practices in the field of business and commerce. Future advances promise more innovations. These changes have made easier and quicker many of the tasks which comprise the processes of the business world. At the same time, however, these changes have made these operational tasks more complex.

In order to meet the challenges of the nation's changing and evolving economic and technological environment, occupational education itself is in the process of change. The evolution from single-instructor concepts to team-instruction methods is but one example. Another notable trend is visible in curriculum structure: those skills and concepts which are generalizable to an entire cluster of occupations are considered the most appropriate for occupational curricula. Such generalizability is to be highly desired, for it is realized that a primary objective of education is the development of adaptability in individuals. Similarly, the facilities supporting education must reflect these changes, encouraging multiple-use, discouraging high degrees of specificity and allowing adaptation to purposes of the as yet dimly perceived future.

There is emerging a more general acceptance for the use of electronic teaching aids. These are taking the form of both individual teaching devices (teaching machines) and group teaching devices (educational TV, film presentation, audio visual presentations, etc.) While it is difficult at this time to accurately predict the future use of these devices, their size, power and space requirements, it can be agreed that whatever general provisions can be made now for their future use should be explored. Thus, general architectural and design considerations should provide for adapting the use of these devices in the future with the least extensive facility change.

Student Groups

Number of Students and Utilization of Facilities

Data collected on the nature of the community population, the needs of the region for workers in business occupations and the experiences of other colleges in enrolling occupations and pre-business students suggest the student populations for this college unit as shown in Table 17.1. The daytime instructional staff required by such an enrollment is also shown in the table.

Certificate students will spend approximately two-thirds of their total time per day in laboratory facilities and one-third time in classrooms. Associate degree students, conversely, will spend approximately one-third of their time in laboratories and two-thirds in classrooms. The resulting clock hour usage of specialized facilities is projected in Table 17.2 for the enrollments herein assumed.

The planning of facilities for this enrollment of 900 is based on the assumption that approximately one-third of the total activity-hours will be spent in laboratories and the remaining two-thirds will be spent in general classrooms. Assuming that the average student produces 18 indoor contact hours per week, this enrollment would generate 5,400 laboratory contact hours per week and 10,800 general classroom contact hours per week.

Based on a laboratory room utilization of 60 per cent, a student station utilization of 85 per cent and an effective 8-hour day (40 hour week), a total of approximately 265 laboratory student stations will be required.

Based on a general classroom utilization of 80 per cent, a student station utilization of 85 per cent and an effective 8-hour day (40 hour week), a total of approximately 400 general classroom student stations will be required.

TABLE 17.1

PERSONNEL ASSOCIATED WITH BUSINESS AND COMMERCE AND WITH PRE-BUSINESS ADMINISTRATION

Area	Projected Student Enrollment	Instructional Staff Requirement
Certificate Programs		
Office Occupations	30	2
Bookkeeping	30	2½
Marketing & Retail Selling	25	2
Sub-Total	85	6½
Associate and Diploma Programs		
Accounting and Finance	90	4
Data Processing	40	3
Real Estate	75	3
Bookkeeping	60	2½
Insurance Risk Management	75	3
Retail Selling	50	2
Secretarial Science	150	6
Office Management	75	3
Stenography	60	2½
Sub-Total	675	29
College Parallel Programs		
Pre-Business Administrtion	225[a]	9
Total	985	44½

[a] Based on existing college practice.

TABLE 17.2

CLOCK HOUR USAGE OF FACILITIES RELATED TO THE BUSINESS AND COMMERCE AREA AND TO PRE-BUSINESS ADMINISTRATION

	Total Students	Mean Daily Hours Per Student In Class	Mean Daily Hours per Student in Laboratory
Certificate Curricula	85	2	4
Associate Degree Curricula	675	4	2
Pre-Business Administration	225	15 (a)	3 (a)
Total	985		

[a] Weekly hours.

Spaces Needed to Implement the Instructional Program in Business and Commerce and Pre-Business Administration

Because of the extensive enrollment and diverse activities included in this chapter, statements and descriptions of teaching and learning activities and student groups are provided under the following sections:

A. Pre-Business Administration

B. Occupational Programs in Office Occupations and Secretarial Science

C. Occupational Programs in Business Management, Accounting and Finance

D. Data Processing

E. Occupational Programs in Marketing and Distribution

An overriding unity exists or should exist between the philosophies and activities of the various departments described in this chapter. For this reason, the facilities which are recommended are considered as supporting the entire program of Business, Commerce and Pre-Business Administration.

While an attempt has been made to describe separately the various programs, activities within the programs and student groupings within the programs, all facilities are recommended together in a latter portion of this chapter.

Pre-Professional Business Administration

Teaching and Learning Activities

Teacher activities will include lecture demonstration, use of visuals and audio-visuals, consulting with individuals, leading discussions and supervising student practice. Student activities will include listening to lectures, taking notes, observing demonstrations, observing visuals and audio-visuals, participating in discussions, participating in seminars and practice in the development of skills.

Student Groups

Class sizes are expected to be 30-35 students in first-year courses and approximately 20 students in second-year subjects. The possibility exists that large lecture sections (120 students) associated with small seminar sections (20 students) may be used as a scheduling paradigm.

Occupational Programs in Office Occupations and Secretarial Science

Curriculum and Courses

The courses of the curricula include the following:

1. Secretarial Science
2. Stenography
3. Typing and General Clerical

The courses which appear in the above curricula include the following:

1. Typing I
2. Typing II
3. Typing III
4. Typing-Speed
5. Shorthand I
6. Shorthand II
7. Shorthand III
8. Transcription I
9. Transcription II
10. Transcription III
11. Comptometry
12. Machine Transcription
13. Business English
14. Secretarial English
15. Office Practices
16. Secretarial Practice
17. Filing
18. Office Production

Curricular areas closely allied to this area of specilization include the following:

1. Communications
2. Business Arithmetic
3. Personal Development
4. Business Ethics
5. Penmanship and Spelling
6. Machine Transcription
7. Rotary Calculator
8. Key driven Calculator
9. Bookkeeping

Teaching and Learning Activities

Teacher activities will include lecture, demonstration of techniques, demonstration of devices, supervision of practice, consultation with individuals, presentation of visuals and audio-visuals and time-testing. Student activities will include listening to lectures, observing demonstration, practicing techniques, becoming familiar with equipment and devices, practice in the development of skills, practice in the development of productive speed, observing visuals and audio-visuals and demonstration of proficiency by time-tests.

Student Groups

Class sizes are expected to be 30-35 students in all begining courses. Student groups in the Degree Program are expected to be more homogeneous than in diploma or certificate courses, where it is expected to find a wider range of age and ability levels. It is not expected that students in associate degree programs, certificate programs and diploma programs will be simultaneously scheduled in any classes.

Occupational Programs in Business Management, Accounting and Finance

Curricula and Courses

Curricula will be based on the following instructional areas:

1. Accounting and Finance
2. Data Processing
3. Bookkeeping
4. Accounting Machine Operation

The courses which appear in the above curricula include the following:

1. General Business
2. Statistics
3. Finance
4. Business Mathematics
5. Accounting
6. Income Tax Accounting
7. Orientation to Accounting Machines
8. Business Law
9. Cost Accounting Auditing
10. Adding Machine Operation
11. Calculators
12. Accounting Machines
13. Bookkeeping
14. Business English
15. Typing

Curricular areas closely related to this college unit include the following:

1. Economics and other Social Studies
2. Office Occupations
3. Communications
4. Management
5. Humanities

6. Data Processing
7. Marketing and Distribution

Teaching and Learning Activities

Teacher activities will include lecturing, working on the chalkboard and with the overhead projector, using closed-circuit TV, leading discussions, supervising performance of students, using visuals and audio-visuals, demonstrating devices and preparing visuals for use on the overhead projector.

Student activities will include listening to lectures, participating in discussions, observing demonstration visuals and audio-visuals, taking notes, solving problems in workbooks, using machines, using programmed text materials and demonstrating proficiency by proper use of machines and techniques in case study problems and on tests.

Student Groups

Class sizes are expected to be 30-35 students in all courses, with the following exceptions:

1. Beginning classes in Accounting and in General Business may be taught in large classes (120 students) having small subsections (20 students) which meet on alternate days.
2. Law and Advanced Accounting classes are expected to have a seminar format, with class sizes of 20 students.
3. Accounting Machines Operation classes will accommodate only 12 students (24 if teamed in pairs).
4. Occupational Extension and Community Service classes will have a "large group" (up to 120) format.

The group of students in Associate Degree and Diploma programs will be somewhat homogeneous in its characteristics, composed primarily of young adults who have recently completed secondary school. Students in Certificate programs are expected to be much more heterogenous with respect to age, ability levels and the like.

Occupational Programs in Data Processing; The Computer Center

Introduction

Data Processing is a course of study heretofore administered under the general occupational area of Business Management, Accounting and Finance. For convenience in writing this document and because the facilities of Data Processing will serve a campus-wide function, the edspecs for Data Processing Facilities have been prepared separately. It is likely that full implementation of this program will be delayed and that gradual development of this capability will be the pattern followed.

Because the college computer system is so integrally a part of the Data Processing Facilities, it is appropriate that the Computer System be described here. For that reason, an extended verbatim quotation from a study document related to the computer center is given in the following section.

A Data Processing Center For Seattle Community College[1]

The effects upon contemporary life of computers and other automation-related devices are so well known that they need no comment. The ramifications to date of these aspects of technology have been enormous; there is an almost inestimable potential for the future. The community college, as the major force in higher education for the future, must face the challenges which automation hurls and must adapt its purposes, adjust its philosophy and adopt the necessary methods to meet such challenges. No longer viable is Carlisle's concept that "the true university is a collection of books;" rather, the institution of higher education is a collection of ideas and tools and computers which are major tools for learning.

Seattle Community College, to achieve the standard of excellence to which it rightfully aspires, will require a data processing system. No such system less than a network consisting of a sophisticated central computer with three terminals—one on each campus—can be visualized as fulfilling the projected needs of the College. Recommendations for a flexible, workable system follow.

The Ultimate System

When all three campuses of the Seattle Community College have been completed, the computer system for the College should consist of several major elements. A central computer (suggested: IBM 360 Model 40 or 50), to be installed at the last campus built, has smaller satellite computers (suggested: IBM 360 Model 20). The smaller computers allow for "hands-on" instruction and operation at each campus in isolation from the system.

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[1] Associated Consultants in Education. "A Data Processing Center for Seattle Community College," paper prepared for General Planning Concepts Committee, Seattle Community College (July, 1966), Processed.

They also serve as input terminals to the larger, more sophisticated and versatile central computer. Time-sharing and multiple programming features of the central computer will allow for a variety of operations to be performed almost simultaneously, with input or output from any or all satellite computers and an appreciable number of other remote terminals.

The capabilities, features and some suggested items of equipment are summarized below.

Capabilities

- Data Processing Instruction
- Financial Records of College
  - Payroll
  - Tuition and Fee Accounting
  - Budget and Internal Audit
  - Inventory
- Student Scheduling
  - Individual Schedules
  - Resolution of Conflicts
  - Room Schedules
  - Class Rolls
- Registrar/Admissions Records
  - Grade Reports
  - G.P.A. Computations
  - Counselling Records
  - Transcripts
  - Deficiency Reports
- Institutional Research
  - Student Characteristics
  - Grading Characteristics
- Computer Assisted Instruction
- Information Retrieval
- Computer Usage in Support of Instruction

Features

- Operation in Isolated Mode
- Operation in Connected Mode
- Multiple Programming

Multiple Terminals
Multiple Card Processing Operations
High-speed Input/Output
High-speed Data Handling
Communications Adapter
Up to 6 Input/Output Devices Simultaneously
Solid State Circuitry

Equipment

1 IBM/40 or 50
2 IBM/40 or 50
3 IBM/20
Dataphones
Teleconnections

Staffing (on administrative staff)

7	Professional Staff
5	Clerks/Stenographers

The Interim System

An interim system can consist of an IBM 360 Model 20 located on the first-built Campus, and the associated teleconnections to the IBM 360 located at the Seattle School District offices. When the second campus site is developed, a second IBM 360 Model 20 can be installed there and then. Upon completion of the third campus, both a Model 20 and a Model 50 can be installed. At this time all connections with the District computer can be transferred to the College IBM 360/50, thus making complete and self-contained the ultimate system suggested previously.

A list of the major components of the IBM 360 Model 20 system for the first-built Campus is given below; the approximate monthly rental cost for this suggested Model 20 system is $2,800.

1	360/2020	Computer
1	2501	Card Reader
1	2560	Multifunction Card Machine
1	2203	Printer
2	2415	Tape Units

Philosophy and Objectives

The instructional program in Data Processing is designed to provide men and women with competencies to utilize data processing systems in contemporary technical, business and scientific applications.

Curricula and Courses

The courses which may appear in the Data Processing curriculum include the following:

1. Introduction to Data Processing
2. Data Processing Mathematics
3. Data Processing Operations
4. Unit Records
5. Data Processing
6. Systems Design
7. Computer Programming
8. Service courses for other divisions

Curricular areas closely related to the Data Processing curriculum include:

1. Communications
2. Science
3. Mathematics
4. Humanities-Social Studies
5. Business Management
6. Office Occupations
7. The Engineering Technologies
8. Electrical Occupations

Teaching and Learning Activities

Teacher activities will include lecturing, working at the chalkboard and with the overhead projector, supervising performance of students, using visuals and audio-visuals, demonstrating devices and supervising sophisticated equipment. Student activities will include listening to lectures, taking notes, participating in discussions, observing demonstrations, observing visuals and audio-visuals, solving problems, writing computer programs, working with sophisticated equipment, working on individual and team projects and taking information and performance tests.

Student Groups

Class sizes are expected to be 15 students or fewer in advanced courses; whereas beginning courses will probably enroll 25-35 students. Counselling, selective admissions and special aptitude requirements will operate to keep the student enrollment fairly homogeneous.

Occupational Programs in Marketing and Distribution

Curricula and Courses

Courses of study may include the following:

1. Insurance Risk Management
2. Real Estate
3. Retail Management
4. Retail Selling

Courses which will appear in the above program of studies are projected to include:

1. Risk Insurance
2. Credit and Collection
3. Underwriting
4. Agency Management
5. Risk Management
6. Contracts
7. Easements
8. Titles
9. Zoning
10. Public Relations
11. Marketing
12. Marketing Management
13. Marketing Problems
14. Retailing & Merchandising
15. Marketing Research
16. Salesmanship
17. Product Study
18. Sales Promotion
19. Cooperative Work Seminars
20. Accounting

Curricular areas closely allied to this area of specilization include the following:

1. Communications
2. Personal Development
3. Business Ethics
4. Business Arithmetic

Teaching and Learning Activities

Teacher activities will include lecture, demonstration of techniques, demonstration of devices, supervision of practice, consultation with individuals and presentation of visuals and audio-visuals. Student activities will include listening to lectures, observing demonstrations, practicing techniques, becoming familiar with equipment and devices, practice in development of skills, practice in development of techniques, observing visuals and audio-visuals and demonstration of proficiency in using techniques.

Student Groups

Class sizes are expected to range from 30 to 40 students in all beginning courses. Student groups in Degree and Diploma programs are expected to be more homogeneous than in the Certificate courses, where it is expected that a wider range of age and ability levels will be found.

Facilities Needed for the Total Program in Business, Commerce and Pre-Business Administration

Figure 17.1 indicates the spaces needed to implement the programs of instruction in pre-professional business and in the business-related occupational curricula.

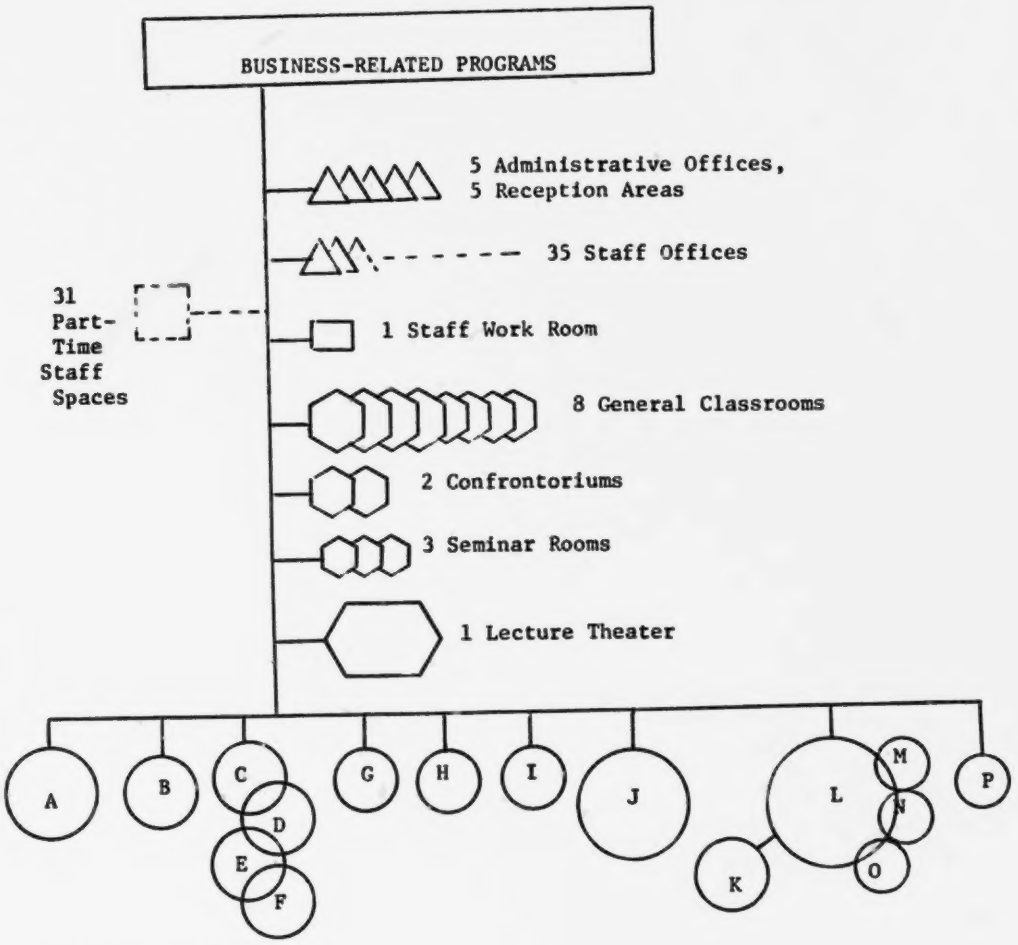
Table 17.3 presents the total spaces recommended. The number of non-specialized student stations exceeds the number which was calculated earlier as required by the total department. It should be pointed out, however, that while this college unit requires the use of a lecture theater, it is anticipated that only one-half-time use of it will be by the department.

The entries in Table 17.4 describe the spaces which are listed in Table 17.3 and shown in Figure 17.1.

Figure 17.2 indicate relationships between the facilities of this college unit, and Figure 17.3 shows the relationships between these facilities and other facilities on campus.

FIGURE 17.1

SPACES NEEDED TO IMPLEMENT THE INSTRUCTION PROGRAM RELATED TO BUSINESS


BUSINESS-RELATED PROGRAMS
5 Administrative Offices,
5 Reception Areas
35 Staff Offices
31 Part-Time Staff Spaces
1 Staff Work Room
8 General Classrooms
2 Confrontoriums
3 Seminar Rooms
1 Lecture Theater
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

A. Accounting Lab
B. Statistics Lab
C., D, E, F. Typing Lab
G. Office Machines Lab
H. Accounting Machines Lab
I. Calculations Lab
J. Marketing Lab
K. Advanced Programming Lab
L. Computer Center
M. Key Punch Room
N. Unit Records Room
O. Card Storage
P. Student Practice Room

FIGURE 17.2

GENERAL RELATIONSHIP OF SPECIALIZED SPACES WITHIN BUSINESS AND COMMERCE

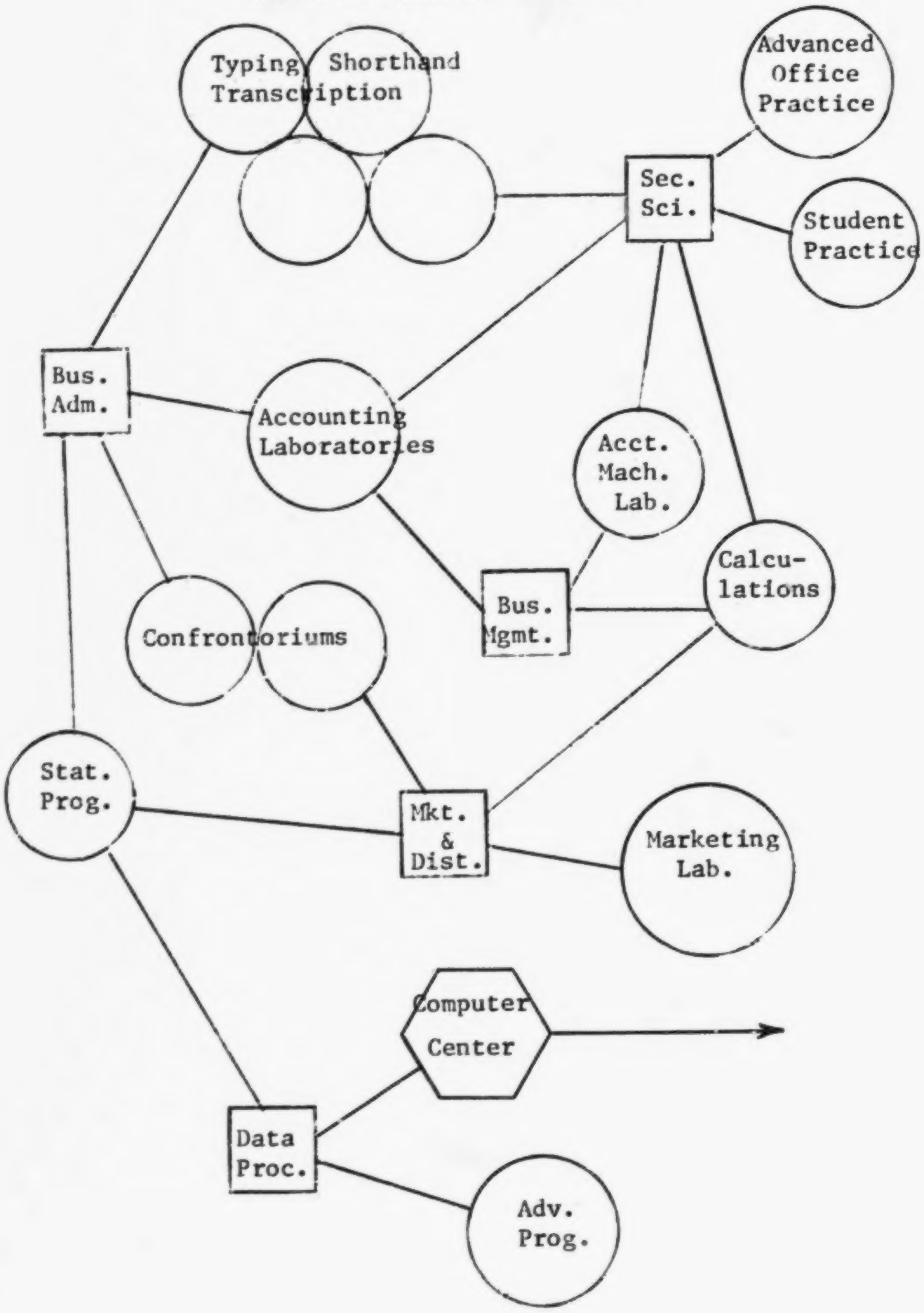

Typing
Transcription
Shorthand
Advanced Office Practice
Sec. Sci.
Student Practice
Bus. Adm.
Accounting Laboratories
Acct. Mach. Lab.
Calculations
Bus. Mgmt.
Confrontoriums
Stat. Prog.
Mkt. & Dist.
Marketing Lab.
Computer Center
Data Proc.
Adv. Prog.

FIGURE 17.3

GENERAL RELATIONSHIP OF THE FACILITIES FOR BUSINESS AND COMMERCE TO OTHER FACILITIES ON CAMPUS

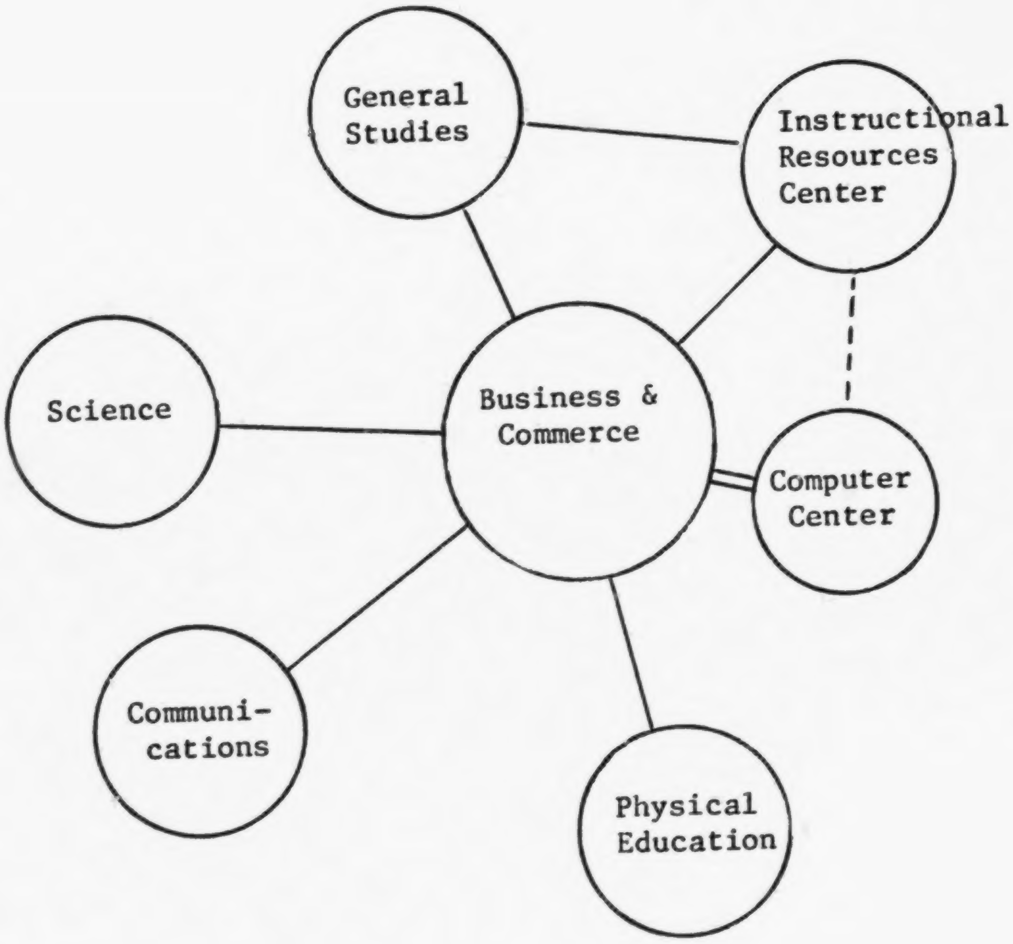

General Studies
Instructional Resources Center
Science
Business & Commerce
Computer Center
Communications
Physical Education

TABLE 17.3

SPACES REQUIRED FOR THE BUSINESS, COMMERCE AND BUSINESS ADMINISTRATION PROGRAMS

	Type of Space	Units	Area Per Unit	Student Capacity Per Unit	Total Capacity	Total Area Sq. Ft.
I.	**Instructional (Specialized)**					
	Accounting Lab	2	1,000	36	72	2,000
	Statistics Lab	1	800	30	30	800
	Typing, Shorthand & Transcription	7[a]	1,400	35	245	9,800
	Adv. Office Machines Lab	1	1,200	30	30	1,200
	Accounting Machine Lab	1	1,100	24	24	1,100
	Adv. Programming Lab	1	400	20	20	400
	Calculations Lab	1[b]	750	30	30	750
	Marketing & Distribution Activities Lab	1	1,800	40	40	1,800
	Sub-Total	15			491	17,850
II.	**Instructional (Non-Specialized)**					
	Lecture Theater	1[c]	2,000	150	150	2,000
	Confrontoriums	1	850	40	40	850
	General Classrooms	2	600	30	60	1,200
	General Classrooms	2	800	40	80	1,600
	Seminar Rooms	3	300	15	45	900
	Sub-Total	9			375	6,550
III.	**Auxiliary**					
	Computer Center	1	800	—	—	800
	Key Punch Room	1	300	8*	8*	300
	Student Practice Rooms	1	300	10*	10*	300
	Unit Record Equipment Room	1	400	—	—	400
	Card Storage Room	1	100	—	—	100
	Sub-Total	5			18*	1,900

TABLE 17.3 (Cont'd)

SPACES REQUIRED FOR THE BUSINESS, COMMERCE AND BUSINESS ADMINISTRATION PROGRAMS

Type of Space	Units	Area Per Unit	Student Capacity Per Unit	Total Capacity	Total Area Sq. Ft.
IV. Offices and Work Spaces					
Department Heads' Offices	5	150	—	—	750
Department Secretaries' Offices	5	120	—	—	600
Departmental Workroom	1	100	—	—	100
Day Faculty Offices	35	80	—	—	2,800
Evening Faculty Spaces	31	20	—	—	620
Sub-Total	77			—	4,870
Total	106			866 18*	31,170

*Non-Scheduled Student Stations.

[a] Unit assignable to Health Occupations; medical and dental secretaries will use this space.

[b] Assignable partially to Engineering Technology.

[c] Not wholly assignable to this unit.

TABLE 17.4

COMMENTS ON SPECIALIZED SPACE NEEDS FOR THE DIVISION OF BUSINESS, COMMERCE AND BUSINESS ADMINISTRATION

A. **Accounting Labs** (2 each)

Approximate Room Area	1,000 square feet
Student Stations	36
Usage	Bookkeeping and Accounting
Furniture and Equipment	9 (4′ x 6′) tables, 36 student chairs, 1 instructor's station, 1 cabinet storage unit (wall-length) with wiring for 5 adding machines, chalkboard, corkboard, storage racks for student's books under tables.
Remarks	RAMP services, especially overhead projection capability.

TABLE 17.4 (Cont'd)

COMMENTS ON SPECIALIZED SPACE NEEDS FOR THE DIVISION OF BUSINESS, COMMERCE AND BUSINESS ADMINISTRATION

B. **Statistics Labs** (1 each)

Approximate Room Area	800 square feet
Student Stations	30
Usage	Statistics, computations, Bookkeeping, Computer Programming.
Furniture and Equipment	12 3′ x 5′ tables, 30 student chairs, 1 wall-length cabinet, 6 calculators, 6 adding machines, 1 instructor's station, chalkboard, corkboard.
Remarks	Noise suppression, RAMP services, electrical service at wall length cabinet and at each table.

C. **Typing, Shorthand, Transcription Labs** (7 each)

Approximate Room Area	1,400 square feet
Student Stations	35
Usage	Typing, Shorthand, Transcription, Business, English, Speed Building, Machine Transcription.
Furniture and Equipment	35 L-shaped desks, 35 student secretarial chairs, 1 instructor's demonstration desk, 35 electric typewriters at student desks, 35 transcription devices at student desks, chalkboard, corkboard.
Remarks	Noise suppression, aisle space for instructor circulation, electric service at each station, RAMP services to be used, in-room storage. This is a "High-Visibility" area.

D. **Advanced Office Machine Labs** (1 each)

Approximate Room Area	1,200 square feet
Student Stations	30

TABLE 17.4 (Cont'd)

COMMENTS ON SPECIALIZED SPACE NEEDS FOR THE DIVISION OF BUSINESS, COMMERCE AND BUSINESS ADMINISTRATION

Usage	Advance Office Practice, Duplication, Filing, over-flow from other labs.
Furniture and Equipment	30 desks and chairs, 30 electric typewriters, 30 transcription devices, 2 PBX stations, with 30 telephones at student desks, file cabinets.
Remarks	Noise suppression, electric service to all stations, simulate a contemporary office setting for this laboratory. This is a "High Visibility" area. Consider ceiling electric service in order that desks may be moved. Provide for central dictation through telephone system.

E. **Accounting Machine Labs** (1 each)

Approximate Room Area	1,100 square feet
Student Stations	24
Usage	Accounting machines operation, survey courses in accounting machines.
Furniture and Equipment	5 Burroughs Accounting Machines, 5 NCR Accounting Machines, 2 Electronic Accounting Machines, 5 Adding Machines, 1 Typewriter, Storage Cabinets for special supplies, 10 ledger trays, chalkboards with map rails, multi-panel sliding display.
Remarks	Noise suppression, aisle space for student and instructor circulation. This is a "High Visibility" area.

F. **Advanced Programming Laboratories** (1 each)

Approximate Room Area	400 square feet
Student Stations	20
Usage	Programming courses, incidental use by students in other divisions.

TABLE 17.4 (Cont'd)

COMMENTS ON SPECIALIZED SPACE NEEDS FOR THE DIVISION OF BUSINESS, COMMERCE AND BUSINESS ADMINISTRATION

Furniture and Equipment	8 tables with student chairs, inroom storage.
Remarks	Access to key-punch room and unit records room. Conductive to independent work.

G. **Calculations Laboratories** (1 each)

Approximate Room Area	750 square feet
Student Stations	30
Usage	Instruction and practice in Adding Machines, Calculator, Engineering Calculations.
Furniture and Equipment	Continuous surface desks, 30 student chairs, 1 instructor's station, RAMP services, 20 adding machines, 10 rotary calculators, in-room storage cabinets, 1 demonstration slide-rule, 1 demonstration abacus, chalkboard, corkboard.
Remarks	Electric service at student stations, noise suppression, provide floor wiring in nearby classroom area for possible duplication or expansion of this facility. This is a "High Visibility" area.

H. **Marketing and Distribution Activities Laboratories** (1 each)

Approximate Room Area	1,800 square feet
Student Activity Stations	40
Usage	This would be a large divisible space where many activities could be taking place simultaneously. The large floor space could be thought of as many zones of activity, some scheduled and others open lab activities. Electrical outlets with overhead service should be provided. These centers may include the following:

TABLE 17.4 (Cont'd)

COMMENTS ON SPECIALIZED SPACE NEEDS FOR THE DIVISION OF BUSINESS, COMMERCE AND BUSINESS ADMINISTRATION

Merchandising Control Center, where ordering, receiving, marking, storing, inventory control and related activities would take place. Equipment would include dummy merchandise of all kinds, i.e., food stuffs, packaged soft goods, small hardware, boxed items, etc. Equipment also would include marking equipment, labels and tickets, inventory, buying/ordering/control forms.

Merchandise and Product Knowledge Study Center, where the study of basic materials of consumer goods such as leathers, natural and man-made fabrics, home furnishings and general product classification categories, petroleum and automotive related products could be studied. Equipment would include mock-ups, cut-aways, large charts, manuals, pamphlets and samples.

Customer Sales and Service Center, where presentation of merchandise (or service) to customer, arrangement of stock for self-service, self help or personal selling, point of sale, presentation of merchandise and other types of activities could be experienced and practiced. Equipment would include merchandise gondolas and shelving, drygoods, fixtures and glass binning. Also needed would be portable check-out stands, scales and small self-service baskets or carts.

Point of Sale and Visual Display Preparation Center, where the preparation of a wide variety of visual merchandise or service displays and signs could be practiced and experienced. Equipment would include a variety of small display fixtures, draping materials, paper sign paints, shadow boxes and a sink with counter space.

Pupil-Teacher Conference Center, where the planning for study and work activities with an individual or a small group could take place. Equipment would include a teacher's desk and chair, small table, two drawer steel file, book shelving and a couple of chairs.

Flexibility	As much as possible, the equipment which is needed and which is provided for use of these centers should be planned so that it can be rolled or otherwise moved into storage units along the walls, or replaced as business methods change. The entire space should be de-

TABLE 17.4 (Cont'd)

COMMENTS ON SPECIALIZED SPACE NEEDS FOR THE DIVISION OF BUSINESS, COMMERCE AND BUSINESS ADMINISTRATION

signed for room darkening and audio-visual presentations.

I. **Computer Centers** (1 each)

Approximate Room Area	800 square feet
Usage	"Hands-on" instruction for Data Processing and Electrical Students; used by professional staff in implementing services of the College Computer System.
Furniture & Equipment	IBM 360/20 Computer, 2 tape units, 1 multi-function card machine, 1 printer, 1 card reader, miscellaneous furniture, storage.
	Free access floor (8 inches), airconditioning, multiple teleconnections to outside, maximum "visibility" including a glass wall separation.
	From one of the recommended 30-student station general classrooms; this class may be so designed that its front wall will be of glass and allow the occupants to see the activities which take place in the computer center.

J. **Key Punch Rooms** (1 each)

Approximate Room Area	300 square feet
Student Stations	8
Usage	Incidental use by secretarial science students, use by other divisions, use as productive facility.
Furniture & Equipment	6 key punch, 2 verifiers, 8 secretarial chairs.
Remarks	Free access floor, noise suppression, access to Unit Records Room.

TABLE 17.4 (Cont'd)

COMMENTS ON SPECIALIZED SPACE NEEDS FOR THE DIVISION OF BUSINESS, COMMERCE AND BUSINESS ADMINISTRATION

K. **Student Practice Rooms** (1 each)

Approximate Room Area	300 square feet
Student Stations	10
Usage	Special private practice, unscheduled, tutorial activities, independent work in speed building typing.
Furniture & Equipment	10 typing carrels with chairs, 10 electric typewriters (various models), 1 study table, incidental seating.
Remarks	Noise suppression, access to corridors, electric service to carrels.

L. **Unit-Record Equipment Rooms** (1 each)

Approximate Room Area	400 square feet
Usage	Data Processing
Furniture and Equipment	Reproducing punch, collator, sorter, card storage cabinets, miscellaneous tables.
Remarks	Free access floor (8 inches), noise suppression, access to computer center, key punch room, computer-related facilities.

M. **Card Storage Rooms** (1 each)

Approximate Room Area	100 square feet
Usage	Storage of blank and punched cards.
Furniture and Equipment	Filing cabinets for IBM cards, shelving.
Remarks	Maximize storage, including ladder to reach high points; carts will be rolled into this area from outside; this area is also a program li-

TABLE 17.4 (Cont'd)

COMMENTS ON SPECIALIZED SPACE NEEDS FOR THE DIVISION OF BUSINESS, COMMERCE AND BUSINESS ADMINISTRATION

	brary and should not provide access to unauthorized personnel.
N. **Confrontorium** (1 each)	
Approximate Room Area	850 Square Feet
Usage	For scheduled classes of a discussion or debate type. Space could also be used for lecture classes.
Furniture and Equipment	40 student stations. Suggest tier-mounted strip tables in a "U" or "V" shape, with instructor's podium at center. Approximately ½ of students should face other ½ of students.
Remarks	No window requirements. Electrical provisions at podium and around room periphery. Audio visual and educational T. V. capability.
O. **Faculty Offices** (36)	
Approximate Room Area	80 square feet
Usage	By faculty members for study, conferences with individual students, lesson preparation, reading.
Furniture and Equipment	Desk, office chair, filing cabinets, bookcase, side chair, telephone, electrical outlets.
Remarks	No window requirement. Privacy desirable.

XVIII

FACILITIES FOR PERSONAL SERVICES AND RELATED OCCUPATIONS

Philosophy and Objectives

Two major educational streams, home management and child care, are included in the programs of instruction conducted in this area. This area is one of several college activities devised especially to meet the needs of women in the community. Preparation both for first careers and second careers will be provided.

The purpose of the home management program is to provide for individuals enrolled in Secretarial Science or other occupational specialties a set of parallel learning experiences which will prepare such individuals for successful combination of two careers, one in the home and the other outside. The purposes of the child care program are to train individuals, including parents, in the disciplines of child psychology and child development and to give practical experiences in this field by means of observation of and participation in child care activities.

It is expected that activities in the general area of child care will be increased in the future. Instructional programs related to preparation of semi-professional teachers' assistants at various levels have been inaugurated in some community colleges; Seattle Community College in the future may well devise programs for such training.

All courses in the occupational area of Personal Service are available for elective credit to any members of the student body, and the facilities are to be shared with other areas. Hence, one purpose of this college unit is to provide opportunities for personal improvement and to satisfy personal interest for a wide range of students.

Curricula and Courses

The curricula include the following:

1. Home Management
2. Child Care

The courses which appear in the above curricula include the following:

1. Clothing Construction 2. Food Preparation

3. Nutrition
4. Housing for the Family
5. Family Finance
6. Equipping the Home
7. Personal and Family Food Management
8. Educational Psychology
9. Interpersonal Relationships
10. Study of the Individual Child
11. Principles of Preschool Education
12. Child Development
13. Preschool Curriculum
14. Language Arts for Young Children
15. Music and Art for Young Children
16. Practice Teaching in the Preschool

Curricular areas which may be allied with these areas of specialization include the following:

1. Secretarial Science
2. Marketing and Distribution
3. General Adult Education
4. Business Management. Accounting and Finance

Teaching and Learning Activities

Teacher activities include lecturing, demonstrating devices and techniques, using chalkboard, using visuals and audio-visuals, using the overhead projector, answering questions, giving individual help, leading discussions, supervising performance and information tests, supervising practice in laboratories, administering a Child Care Center and supervising practice teachers in a Child Care Center.

Student activities include listening to lectures, taking notes, observing demonstrations, visuals and audio-visuals, asking questions, participating in discussions, sewing, cooking, practicing use of devices and techniques, working on individual projects, working as members of a team in projects, making performance and information tests, observing activities in a Child Care Center and practice teaching in a Child Care Center.

Emerging Concepts and Developing Trends

The contemporary woman is playing a more and more important role in the national labor pool. A decade ago women constituted 30 percent of the labor force; today 38 percent of the gainfully employed are women. This is an increase of one-fourth in a period of only ten years. This trend promises to be a continuing and expanding one. These women are necessarily combining careers in offices, stores, schools, health agencies or factories with careers in the home, for whether they have families or not, they have responsibilities for selection, utilization and management of food, clothing, and household equipment and furnishings. Working mothers, especially, create a new dimension in society. These women need to be able confidently to leave their children in the care of competent, trained personnel while at work. Such a need has implications for the child care program projected for the college. The college has a special opportunity to serve all these needs.

Technological advances have already revolutionized practices in food management and clothing care. Future advances promise more innovations. These changes have made physically easier the homemaker's task in many instances, but simultaneously they have made those tasks more complex. The community college can help to clarify the woman's role.

In order to meet the challenges of the nation's changing and evolving economic and technological environment, occupational education itself is beginning a process of change. The evolution from single-instructor conceps to team-instruction methods is but one example. Another notable trend is visible in curriculum structure: only those skills and concepts which are generalizable to any entire cluster of occupations are considered appropriate for occupational curricula. Such generalizability is highly to be desired, for it is realized that a primary objective of education is the development of adaptabiliy in individuals. Similarly, the facilities supporting education must reflect these changes encouraging multiple-use, discouraging high degrees of specificity and allowing adaptation to purposes of the as yet dimly perceived future.

Student Groups

Number of Students and Utilization of Facilities

It is projected that student personnel to the extents indicated in Table 18.1 will be associated with this college unit.

TABLE 18.1

PERSONNEL ASSOCIATED WITH PERSONAL SERVICES AND RELATED OCCUPATIONAL AREAS

Area	Students	Faculty
Home Management	60	3
Child Care	25	2

The usage of the facilities, in clock hours per day, is projected in Table 18.2. It is expected that those students in home management will be spending approximately one-half their time in other areas of the college; this expectation is reflected in the projections given.

TABLE 18.2
CLOCK HOUR USAGE OF THE FACILITIES RELATED TO PERSONAL SERVICES

Area	Total Students	Mean Daily Hours Per Student in Class	Mean Daily Hours per Student in Lab	FTE Students in Class	FTE Students in Lab
Home Management	60	2	2	20	20
Child Care	25	4	2[a]	16	—
Totals	85			36	20

[a]Observation and Internship experiences.

The implications of Tables 18.1 and 18.2 are (1) that laboratories designed for student groups of 20 will most efficiently serve the needs of this area; (2) that the equivalent of one classroom for each area should be adequate for the instructional purposes; and (3) that these facilities can easily be scheduled for use by other college units.

Characteristics of Classes and Students

Class sizes are expected to be 20 students in all courses. It will probably prove feasible to schedule 40-60 students in purely classroom activities with this section split into several 20-student subgroups for laboratory activities. The clientele of the programs in home management is expected to consist primarily of young women; however, all age groups and both sexes have been represented in previous classes. The clientele of the programs in child care is expected to form a widely heterogeneous group with rsepect to age, experience and ability levels but is expected to be primarily women.

Faculty and Staff

Table 18.1 enumerated faculty members associated with this area. A more detailed analysis of these requirements is given in Table 18.3. It is assumed that one of the first five staff members listed will be the administrative supervisor of these curricula.

The implications of Table 18.3 are that the following spaces should be provided:

1 Administrative Office	150 sq. ft.
1 Reception Area	120 sq. ft.
4 Staff Offices, each 80 sq. ft.	320 sq. ft.
6 Offices for 12 p.-t. staff, each 80 sq. ft.	480 sq. ft.
Total Office Area	1,070 sq. ft.

TABLE 18.3

FACULTY AND STAFF MEMBERS ASSOCIATED WITH PERSONAL SERVICES AND RELATED OCCUPATIONS

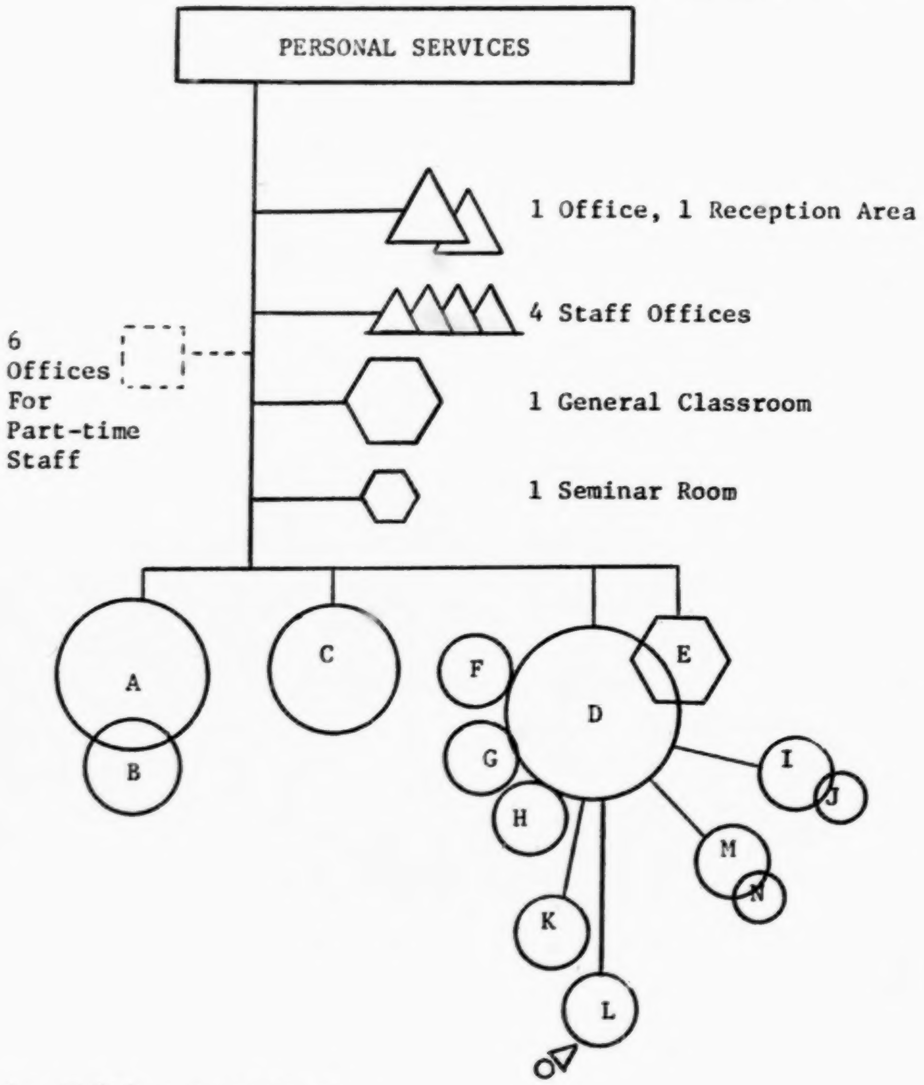
Staff Person	Number
Food Specialist	1
Clothing Specialist	1
Interpersonal Relations Specialist	1
Child Care Attendant	1
Child Development Specialist	1
Evening School Instructors	12
Secretary	1
Total	18

Space Components of the Instructional Program

Figure 18.1 shows the number, type and relationships of spaces suggested to implement the instructional program. It will be noted that the office areas just described, one classroom, one seminar room and several specialized spaces, have been recommended for this area. The major specialized areas include a multi-purpose room with storage, a food preparation room, a child care center and a child observation classroom. Associated with the child care center is also a partially covered, heated outdoor play area. Table 18.4 summarizes the characteristics of these spaces, and subsequent paragraphs describe special aspects of each space. These spaces should be physically associated with each other but may be separate from other facilities on the campus.

FIGURE 18.1

SPACES NEEDED TO IMPLEMENT THE PROGRAMS OF INSTRUCTION IN PERSONAL SERVICES AND RELATED OCCUPATIONS


PERSONAL SERVICES
1 Office, 1 Reception Area
4 Staff Offices
6 Offices For Part-time Staff
1 General Classroom
1 Seminar Room
A
B
C
D
E
F
G
H
I
J
K
L
M
N

A. Multi-purpose Room
B. Storage Room
C. Food Preparation Room
D. Child Care Center
E. Observation Classroom
F. Special Activities Area
G. Snack Kitchen
H. Children's Toilets
I. Isolation Room
J. Isolation Toilet
K. Outdoor Play Area
L. Pick-up and Delivery
M. Staff Work Room
N. Staff Dressing Room

TABLE 18.4

CHARACTERISTICS OF SPECIALIZED SPACES ASSOCIATED WITH PERSONAL SERVICES AND RELATED OCCUPATIONS

Code	Space Description	Student Stations	Instructor Stations	Approximate Area, Square Feet
A	Multipurpose Room	20	1	1,600
B	Storage Area	—	—	300
C	Food Preparation Room	20	1	1,400
D	Child Care Center	6	1	900
E	Observation Classroom	40	1	800
F	Special Activities Area	—	—	100
G	Snack Kitchen	—	—	80
H	Children's Toilet	—	—	150
I	Isolation Room	—	—	60
J	Isolation Toilet	—	—	30
K	Outdoor Area	—	—	1,600[a]
L	Pick-up and Delivery Area	—	—	———
M	Staff Work Room	—	2	150
N	Staff Dressing Room	—	—	175
	Total			7,345[b]

[a] 600 sq. ft. of this should be covered.

[b] Total includes 1,600 sq. ft. of exterior space.

A. **Multi-purpose Room**—Used for Housing for the Family, Equipping the Home, Clothing Construction, Clothing Selection, Personal and Family Food Management and Personal Grooming. This area should be equipped with 20 sewing machines (portable), folding tables for these machines, three cutting tables, four ironing boards, steam irons, a triple mirror, movable privacy screens to provide a dressing and fitting area, laundry facilities (to be closed off behind screens when not in use), furniture for interior decoration (to be stored when not in use), student chairs and an instructor's station. Electric service must be provided for the sewing machines and irons; electric outlets should appear at many locations in the room, heavy equipment should be mounted on dollies, the storage area should be contiguous and necessary plumbing and drainage for laundry facilities must be provided. A sink is required. A display area, accessible to this room, should be provided for the display of student projects. The room should contain chalkboard, corkboard, and be equipped for full RAMP services.

B. **Storage Room**—Used in conjunction with the activities of the Multi-purpose Room just described. Should be adjacent to that room.

C. **Food Preparation Room**—Used for food preparation and Personal and Family Food Management. The lab should contain unit kitchens, including a range, double sink, base and wall cabinets, table and chairs and movable base cabinets for simulating different kitchen layouts. Two refrigerators and a freezer, garbage disposers and various small kitchen appliances must appear. Environmental problems to be solved include those of ventilation, cooling and "spills" in usage. An acoustical problem also exists. Both electric and gas cooking units must be provided. A demonstration mirror should be provided over one unit. Light control is required. Various surface materials may be provided to demonstrate the qualities of these products. Chalkboard and corkboard should be provided, and RAMP services should be provided for. This is a "high visibility" area.

D. **Child Care Center**—This facility is to be used as the laboratory for the child care program. Approximately 12 children will serve as experimental subjects in the center, so the facilities must reflect the needs of the children as well as those of the instruction program. In the center should be "child-size" furniture and equipment. Tables, chairs, easels, dolls, building blocks, a house gym, floor train and other toys will be provided, and storage for these items must be included in the design of the facility. It is considered that a sink for "water play" be provided. The entire area should be divisible into three sections: "soft," "hard" and "wet." The soft area should be carpeted, for quiet activities. The hard area is for active play and for painting, dancing and building with blocks. The wet area is for water play and should have a floor drain.

Special technical considerations apply to this area. (1) Closed-circuit television will originate from this area, for transmission via RAMP to various receiving stations on campus. The children must be minimally aware of this monitoring, however, so the controls for the TV cameras and associated equipment must be remote. (2) Microphones, with remotely controlled switches should be provided in the key areas. These will feed into remote speakers. (3) Video tape will be made of all activities in the hope that occasionally short sequences worthy of saving can be captured and preserved. These tapes, in general, will be erased for reuse on subsequent days, but any significant sections will be edited out. (4) One-way glass will separate this space from the observation classroom, described below.

E. **Observation Classroom**—This facility must be located adjacent to the Child Care Center and be provided with "one-way" glass so that observers can watch both indoor and outdoor activities of the children without distracting them. Observers from this program, from other units of the college and from the community may use the facility. Tiered seating, possibly portable, may be desirable. The room will also be used as a regular classroom with 40 student stations and hence should be equipped with student stations, an instructor station, blackboard, RAMP facilities and the like. The controls for the special technical aids associated with the children's area will be here. Draperies or other covering for the observation ports should be provided so that these ports may be closed when not in use. On-off switches for the communication system from the center to the classroom should also be provided.

F. **Special Activities Area**—This is an area in which children can work alone or in small groups or be placed for disciplinary purposes. It should be carpeted, provided with a door having glass panels and be treated for sound suppression.

G. **Snack Kitchen**—This area is for the preparation of snacks for children and for closely supervised food play. It may well be a pullman kitchen containing a range, refrigerator, sink, dishwasher and storage cabinets. A low serving counter should open onto the main room.

H. **Children's Toilets**—Two WC, two low lavatories, drinking fountain. Low height lavatories and drinking fountains are recommended. Segregation by sex is not necessary. A half-wall may separate this space from the main area.

I. **Isolation Room**—This area is for temporary isolation of a child who becomes ill after arriving at the center. It should contain a bed and one chair. It should be fitted with a door having a glass panel, be continguous to the isolation toilet and be near to the egress point so that the departure of the sick child will affect minimally the other children present. It should be near the office of this unit in order to provide for supervision of any occupant.

J. **Isolation Toilet**—To contain one WC and one low lavatory. This must be contiguous to the isolation room just described and have ingress only from this room.

K. **Outdoor Play Area**—Used for outdoor activities for the children. It will contain parallel bars, jungle gym, swings, play sculptures, see-saw and other toys. It should have both a paved area and a grassed area, a sandbox and a shallow wading pool. The area should be fenced in with chain-link fencing or a similar precaution taken for safety. Outdoor storage should be provided. Part of this area should be covered. Some form of outdoor heating should be provided.

L. **Pick-up and Delivery Area**—This is provided for children arriving and departing via bus or parents' automobiles. The traffic safety considerations are paramount. A nearby reception area may be included with coat racks, etc. Parking for a few visitors' cars may be provided.

M. **Staff Work Room**—This is a most important area, used for the preparation and storage of materials, for conference with student interns, for staff meetings, etc. It should be furnished with a table, six chairs, bookcases and storage facilities in counters and wall cabinets.

N. **Staff Dressing Room**—This space should contain lockers for 18 women staff members, a space for changing clothes, lounge furniture for resting and toilet facilities for women faculty. The space may be compartmented into a dressing area, a lounge area and a toilet area. It should be contiguous to the staff work room described above.

Characteristics of Certain Non-Specialized Spaces Associated with Personal Services

Staff Office—Such a space should contain a desk, swivel chair, bookcase, file cabinet, visitor's chair (s) and corkboard. Provision should be made for a telephone.

Office for Part-time Staff—Such a space should be identical with the Staff Office just described, with the exception that the desk and file cabinet should contain separately secured drawers. Each space of this type will be shared by two part-time staff members.

Relationship of Personal Services Facilities to Other Facilities on Campus

Because of the special nature of the curricular offierings in this college unit, it is suggested that the facilities for child care be associated with facilities for the behavioral science disciplinary areas. Because of the nature of the activities of the children, noise suppression is another major consideration, so that care will be required to minimize this campus distraction. The facilities for home management may be used most often by students also pursuing secretarial studies; therefore, there is some rationale for associating home management facilities with office occupations facilities. The health-related occupations will utilize some of the facilities of this college unit, and hence may be related physically to these facilities. Figure 18.2 indicates these relationships.

Use of Other Facilities by Personal Services Students

Students in this occupational area will use facilities in addiiton to the specialized ones just described to the extent indicated in Tables 18.5 and 18.6.

FIGURE 18.2

RELATIONSHIP OF PERSONAL SERVICE FACILITIES TO OTHER FACILITIES ON CAMPUS

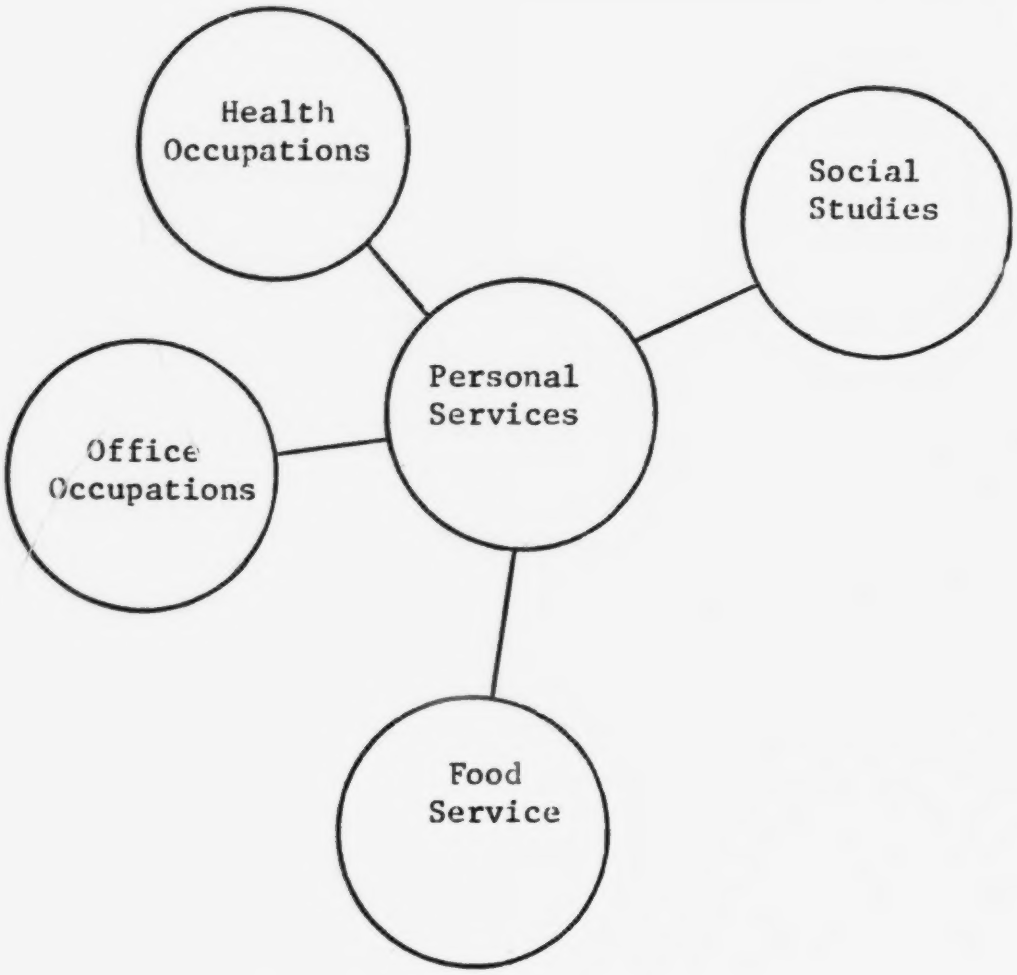

Health Occupations
Social Studies
Personal Services
Office Occupations
Food Service

TABLE 18.5

SPACES NOT INCLUDED IN THE PERSONAL SERVICES UNIT WHICH PERSONAL SERVICE STUDENTS ARE PROJECTED TO OCCUPY REGULARLY, WITH CLOCK HOUR USAGE PER WEEK

Type of Space	Units[a]	Clock Hours/Week
Communications Classrooms	1	9
Social Science Classroom	1	6
Humanities Classroom	1	6
Typing Room	1	10
Office Practices Lab	1	10
Accounting Laboratory	1	3
Psychology Classroom	1	6

[a] A "unit" in this table is considered to be a facility containing more than 20 but fewer than 40 student stations.

TABLE 18.6

SPACES WHICH PERSONAL SERVICES STUDENTS ARE PROJECTED TO OCCUPY OCCASIONALLY, WITH ESTIMATED USAGE

Type of Space	Usage
Lecture Theater for 150 students	4 periods/quarter
Faculty Lounges, Student Lounges, Reception Areas (for laboratory and interior decoration)	Periodically

Summary

The total space needs of the Personal Services Unit are summarized in Table 18.7. Those entries in the table which are enclosed in parenthesis are spaces not directly assigned to this unit, but which should be provided within the framework of the whole college if the programs of this unit are to be implemented fully.

TABLE 18.7

SUMMARY OF SPACES FOR THE PERSONAL SERVICES UNIT

Type of Space	Reference	No. of Units	Total Student Stations	Approximate Area Square Feet
	Table			
Administrative Office	18.3 ff	1	—	150
Reception Area	18.3 ff	1	—	120
Staff Office	18.3 ff	4	—	320
Part-time Staff Spaces	18.3 ff	6	—	480
Multi-purpose Room	18.4-A	1	20	1,600
Storage	18.4-B	1	—	300
Food Preparation Room	18.4-C	1	20	1,400
Child Care Center	18.4-D	1	6	900
Observation Classroom	18.4-E	1	40	800
Special Activities Area	18.4-F	1	—	100
Snack Kitchen	18.4-G	1	—	80
Children's Toilet	18.4-H	1	—	150
Isolation Room	18.4-I	1	—	60
Isolation Toilet	18.4-J	1	—	30
Outdoor Area	18.4-K	1	—	1,600
Pick-up Area	18.4-L	1	—	———
Staff Work Room	18.4-M	1	—	150
Staff Dressing Room	18.5-N	1	—	175
Classroom	Figure 18.1	1	36	720
Seminar Room	Figure 18.1	1	20	420
General Classroom	Table 18.5	(7)	—	———
Lecture Theater	Table 18.6	(1)	—	———
Total				9,555

XIX

FACILITIES FOR BUILDING CONSTRUCTION AND PRE-ENGINEERING/PRE-ARCHITECTURE

Philosophy and Objectives

Four different but related sets of curricula and their supporting facilities are described in this chapter. First, there is described a cluster of occupational curricula related to general carpentry, cabinetmaking/millwork and marine carpentry. The purpose of these curricula is to prepare new workers for entry employment into occupations related to homebuilding, millworking and wood fabrication industries, light contracting and marine construction. Some of the graduates of these programs will be concerned with operational activities in the domain of the home building, general building construction and boat building industries; while still others may be associated with technical sales or other aspects of management.

Second, there is a cluster of occupational curricula related to the construction, general drafting, surveying and landscaping occupations. The purpose of these curricula is to prepare technicians for careers in highly skilled occupations related to highway and bridge construction, medium and heavy building construction, architectural drafting, civil drafting, surveying and landscaping. Some of the graduates of these programs will provide important supporting services for architects, civil engineers and landscape architects; and others may be associated with technical sales or oher aspects of management.

Third, there is a cluster of occupational curricula related to landscape horticulture occupations. The purpose of these curricula is to prepare new workers for careers in occupations related to landscape horticulture.

Fourth, there is a group of courses which community college students planning to transfer to study Architectural Engineering or Architecture at a four-year institution normally will encounter in the community college, either as a requirement for their ultimate transfer or as enrichment to their early college experience. Because of the close relationship between the actities of this college area and the activities of the Pre-Engineering aspect of Electrical and Electronic-related curriculums, it is suggested that the reader see Chapter XV of this document.

Curriculum Descriptions

Curricula Leading to a Certificate

Five curricula—Carpentry, Cabinet-Millworking, Marine Carpentry, General Drafting and Landscape Horticulture—will be offered. These curricula will vary in length, but generally will not exceed 1,440 clock hours or four quarters. It is anticipated that the curricula in Carpentry, Cabinet-Millwork and Marine Carpentry will be structured in a manner providing a common core of instruction for all entering students with options to the various specialties. A typical day for all certificate programs will be six hours in length, with approximately four hours in the shop and two hours in allied supporting instruction.

Curricula Leading to an Associate in Applied Science

Six quarter curricula leading to the Diploma or Associate in Applied Science Degree may be offered in Surveying Technology, Architectural Drafting Technology and Landscaping Design Technology. These curricula will include a minimum of 90 quarter hour credits in a technical specialty, allied supporting and occupational general education instruction at the post high school level. The typical day will be six hours in length, with approximately three hours in shop and laboratory activities and three hours in allied supporting and occupational general education.

Allied supporting and occupational general education courses closely relating to these Associate in Applied Science Degree and Diploma programs of study include:

1. Applied Physics
2. Applied Chemistry
3. Drafting
4. Technical Mathematics
5. Engineering Problems
6. Communications
7. American Institutions
8. Human Relations
9. Descriptive Geometry

Examples of technical specialty courses for these diploma or degree programs are Surveying, Mapping and Computing, Materials of Construction, Applied Mechanics, Hydraulics, Soil Mechanics, Construction Codes, Concrete Construction and Design, Estimating, Strength of Materials, Contracts and Specifications, Timber and Steel Construction, Structural Analysis and Design, and Landscape Construction.

Pre-Engineering or Pre-Architecture

The first two years of a baccalaureate engineering or architecture program will be available at Seattle Community College to students who elect such studies. The offerings will include a core of engineering related duties consisting of an orientation course, a sequence of drawing courses and a sequence of engineering problems courses. Other college areas intimately involved in the curriculum followed by pre-engineering or pre-architecture students include the following:

1. Mathematics
2. Chemistry
3. Physics
4. Communications
5. Data Processing
6. Humanities and Social Studies

Teaching and Learning Activities

Instructor Activities

Instructor activities will include lecturing, answering questions, leading discussions, demonstrating devices and instruments, demonstrating tools, demonstrating problem solving techniques, using visuals and audio-visuals, supervising student performance in the laboratories and shops, giving individual assistance to students and overseeing sophisticated tools and equipment. Various specialized laboratory and shop areas will be used on a rotation basis employing the equipment and facilities required for the several aspects of the curricula.

Allied supporting and occupational general education for certificate programs may be provided by the laboratory-shop instructor and/or other qualified and vocationally certificated personnel. This will include related mathematics, science, trade theory, blueprint reading, layout and sketching. Allied supporting and occupational general education for certificate programs may be provided separately from the technical instruction or integrated into the technical content of the curriculum. Instructors will demonstrate and explain using three-dimension (mock-ups and models) and projected aids and the chalkboard. Closed circuit television may be used when appropriate.

Allied supporting and occupational general education instruction for diploma or Associate in Applied Science Degree programs will be provided by qualified and vocationally certificated personnel. These courses may or may not be taught by the technical speciality instructor. When the need for additional developmental instruction is identified, individualized instruction will be used.

Student Activities

In general, student activities will include listening to lectures, taking notes, participating in discussions, observing demonstrations, visuals and audio-visuals, performing laboratory experiments, working on individual and/or team construction projects and working with sophisticated and often hazardous equipment. More specifically, the student activities in each of the major curricular areas are as follows:

Cabinet Making and Millworking Shop—Construction of cabinets, furniture and detail millwork related to building construction. Use of glues and adhesives, hand tools, fastenings and hardware, power hand tools and power machinery. Construction of sash and doors, veneering, laminating and cores, cabinets and cases, mantles, wardrobes and closets, stairs, stair rails and newels. Use of plastic laminates.

Marine Carpentry Shop—Construction of boats (shipbuilding, lofting, hull construction, joining, outfitting, finishing), boat repair work, cradles and moving, fiberglass techniques. Use of hand tools, hand power tools, power tools and machinery.

Carpentry Shop—Use of hand tools, fastenings and hardware. Use of power hand tools, power machinery and floor mounted wood working machinery. Construction of scale building, including practice in building layout, rough framing, siding, roofing, insulation installation and other typical carpentry activities.

Landscape Horticulture—Student activities will include:

Nurserywork—Propagation by seeds, cuttings, grafting, planting and transplanting indoors and outdoors in flats, pots and other containers, open beds, nursery rows, landscaped garden areas.

Garden Maintenance—Culture of plants, pruning, spraying and fertilizing.

Landscape Construction—Work with plants, soil, wood, plastics, electricity, water, concrete, brick, rock, tile and miscellaneous chemicals.

Floral Work—All stages of production and use of pot plants, foilage plants, cut flowers and supplies.

Pest Control—Identification of pest problems, application of chemicals.

Sales—Customer contact, nursery, floral, landscape work.

Emerging Concepts and Developing Trends

Several important trends seem to be developing in occupational education in general which have implications for the future in the curricular fields being discussed here.

First, professional engineering education is rapidly adopting a science orientation, with emphasis given to mathematical models and other abstractions. Concurrently, less emphasis is being given to the study of engineering operations. This approach is necessitated by the pace of technological innovation occurring in contemporary engineering enterprise. Engineering education is, in fact, vacating the baccalaureate level in favor of advanced degrees. Such a vertical extension of many professional engineering education programs leaves unsatisfied the educational needs of a broad band of operations-oriented technological manpower. *It will be the function of two-year associate degree programs in engineering technology to fill the gap being created.* This is widely recognized by federal agencies, educators and employers alike. Community colleges will be called upon more and more to supply engineering-related education at the associate degree level. The greatest foreseeable expansion in community college activity will possibly occur in this area.

Second, educational institutions are rapidly abandoning single-teacher concepts of vocational education in favor of a team concept of teaching. These institutions are finding that the extent of expertise of any one individual is necessarily circumscribed and, hence, that more effective learning occurs when students are exposed to the viewpoints, experience, insights and perceptions of many specialists rather than one.

Third, because the demands on the resources of educational institutions are so broad and because the needs of any one individual—student or employer—are so discrete, it is rapidly becoming impractical to attempt to meet training needs of high degrees of specificity. Rather, schools must provide an educational experience which is versatile and generalizable. Employers are willing to assume responsibility for certain amounts of specific training; schools can best provide the fundamental, generalizable knowledge and skills which are applicable to clusters of occupations.

Fourth, students are being given more responsibility for their own education. Not only are students capable of learning on their own, but the learning accomplished is often superior to that which is totally directed and supervised by teachers. Independent study, programmed materials, greater use of library materials and exemption credit by examination are but a few examples of the kinds of techniques by which students can proceed in non-class situations. Recent advances in educational technology, including computer assisted instruction, promise to solidify this trend.

Fifth, experimentation with groups of various sizes indicates that large-group, small-group and tutorial instruction when used in combination maximizes the efficacy of collegiate instruction and hence is preferable to any single pattern which might be adopted.

And finally, in an effort to avoid the emergence of the "two cultures" in our community colleges, it is desirable that all college students share some educational experiences with other students whose primary interests differ from their own.

Student Groups

Number of Students:
Estimates of Clock Hour
Usage of Facilities

Data collected on the nature of the community population, the needs of the region for workers in the occupations related to this chapter and the experiences of other colleges in enrolling occupational and pre-engineering students suggest the student populations for this college unit shown in Table 19.1. The instructional staff required by such an enrollment is also shown in the table.

It is expected that the future development in this college unit will see an increase in the number of students enrolled in associate degree curricula and a corresponding decrease in the numbers enrolled in certificate curricula. The number of pre-engineering students related to this area is expected to remain constant or decrease only slightly.

Certificate students will spend approximately two-thirds of their total time per day in laboratory facilities and one-third time in classrooms. Asso-

TABLE 19.1

PERSONNEL ASSOCIATED WITH BUILDING CONSTRUCTION CIVIL/HIGHWAY AND HORTICULTURE CURRICULA AND WITH SECTORS OF THE PRE-ENGINEERING/ PRE-ARCHITECTURE CURRICULUM RELATED TO CIVIL/STRUCTURAL ENGINEERING

Area	Projected Student Enrollment	Instructional Staff Requirement
Certificate Programs		
Carpentry	80	4
Cabinet/Millworking	40	2
Marine Carpentry	40	2
General Drafting	50	2
Landscape Horticulture	20	1
Associate in Applied Science		
Civil/Structural Drafting Technology	35	2
Surveying Technology	35	2
Architectural Drafting Technology	60	3
Associate in Arts		
Pre-Engineering/Pre-Architecture	(300)[a]	3[a]
Total	360	18

[a] Student loading and facilities requirements for pre-engineering are discussed in Chapter XV.

ciate Degree students, conversely, will spend approximately one-third their time in laboratories and two-thirds in classrooms. The resulting clock hour usage of specialized facilities is projected in Table 19.2 for the enrollments herein assumed with the exception of the pre-engineering enrollment which is included in Chapter XV.

TABLE 19.2

CLOCK HOUR USAGE OF FACILITIES RELATED TO THE BUILDING CONSTRUCTION AREA AND TO PRE-ENGINEERING

	Total Students	Mean Daily Hours Per Student in Class	Mean Daily Hours Per Student in Lab
Certificate Curricula	230	2	4
Associate Degree Curricula	130	4	2
Total	360		

Several factors have been taken into consideration in recommending the facilities for this college unit. By further extending the enrollments and hours indicated by Table 19.2, there can be projected a need for facilities to house 980 student contact hours per day in classrooms, and 1,180 student contact hours per day in specialized facilities (labs, shops, etc.). Assuming an 8-hour day, a classroom utilization of 85 per cent, and a student station utilization of 80 per cent, a total of 180 general classroom student stations will be required. Further, assuming an 8-hour day, a laboratory room utilization of 90 per cent and a student station utilizaion of 70 per cent, an approximate total of 270 specialized student stations will be required. A laboratory room utilization of 90 per cent is not unreasonable in this area due to the two 4-hour scheduling blocks per day expected.

Class Sizes

For laboratory and shop instruction, students will generally be grouped into sections of 20 individuals. Allied Supporting and Occupational General Education classrooms should be able to accommodate as many as 40 students. At irregular intervals, there will exist a need for still larger groups of students to meet together. And often, students may work independently or in teams of two, three or four.

Grouping Techniques and Scheduling Paradigms

Certificate level students in the three woodworking certificate curriculums will generally be enrolled at the beginning of each quarter. At the end of the common core of instruction (360 clock hours), students will be assigned to their speciality groups, i.e. carpentry, cabinet/millworking or marine carpentry. To compensate for later attrition and to provide for optimum use of facilities, student groups in the core curriculum may exceed the normal shop group size of twenty. Drafting certificate students will be enrolled quarterly. Continuous enrollment will be allowed in the Landscape/Horticulture certificate program.

Diploma or Associate in Applied Science Degree. Students will be grouped according to level of accomplishment, courses completed and common needs. Students will be rescheduled each quarter on a basis of courses satisfactorily completed, courses needed to afford optimum progress in the curriculum and effective use of the facilities and instructional faculty. Schedules for students in these curricula will be formulated on an individual, not a class basis.

Characteristics of Students

It is expected that the students enrolled in these programs will evidence motivation and ability factors equal to or higher than the mean of the college. Students will generally be high school graduates (primarily male) in the ages ranging from 18 years upward through adulthood. Some students will be employed during the hours they are not attending college. They will normally be healthy and inclined toward precision or semi-precision manipulative work.

The majority of these students will have verbal aptitudes, as revealed by conventional instruments, near the mean for the college; on the other hand, both the quantitative abilities and the abilities to visualize spatially will be appreciably more highly developed in these individuals.

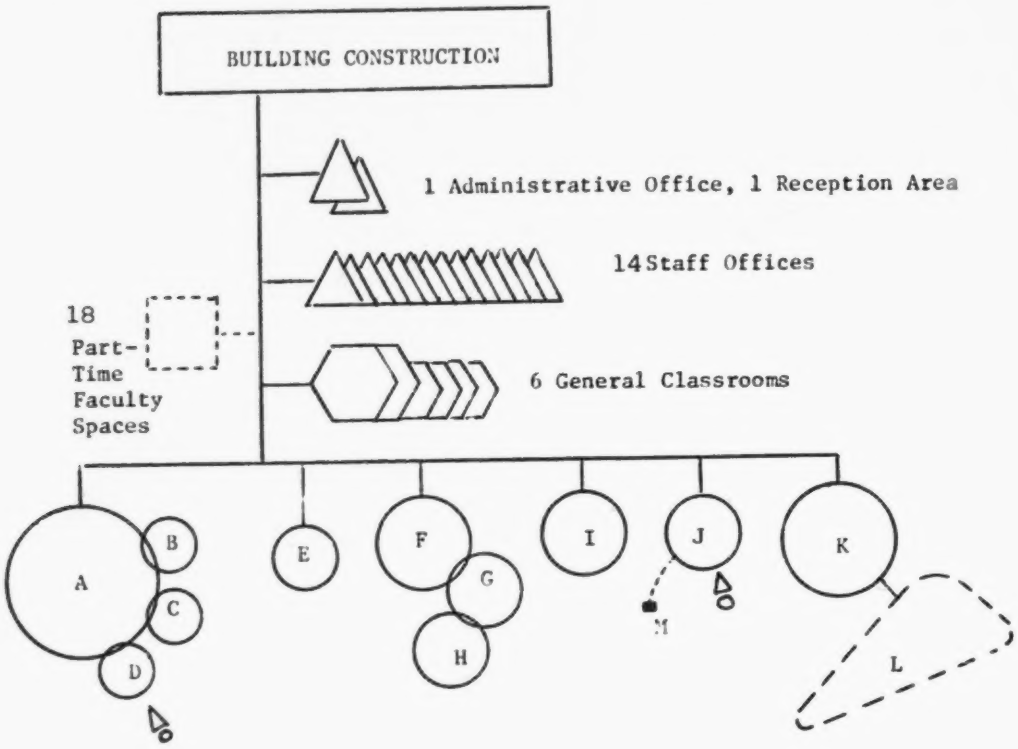
TABLE 19.3

FACULTY AND STAFF MEMBERS ASSOCIATED WITH BUILDING CONSTRUCTION CURRICULA

Staff Person	Number
Program Director	1
Day Instructors	18
Evening Instructors	14
Stock-room/tool-room attendant	1
Secretary-receptionist	1
Total	35

FIGURE 19.1

SPACE REQUIREMENTS TO IMPLEMENT THE INSTRUCTIONAL PROGRAM IN BUILDING CONSTRUCTION AND RELATED CURRICULA


BUILDING CONSTRUCTION
1 Administrative Office, 1 Reception Area
14 Staff Offices
18 Part-Time Faculty Spaces
6 General Classrooms
A
B
C
D
E
F
G
H
I
J
M
K
L

A. Woodshop Complex
B. Wood Finishing Shop
C. Fiberglas Shop
D. Lumber Storage
E. Lockers
F., G., H. Drafting Laboratories
I. Construction Laboratory
J. Geodosy Laboratory
K. Greenhouse
L. Outdoor Areas for Horticulture
M. Bench-mark

Space Requirements

Figure 19.1 shows the spaces needed to implement the instructional program in building construction and related curricula and Table 19.4 summarizes the total spaces recommended to house the Building Construction and Pre-Engineering Pre-Architecture program. Subsequent paragraphs describe special aspects of these spaces. Chapter XV describes spaces associated with pre-engineering and pre-architecture.

TABLE 19.4

SPACES REQUIRED FOR BUILDING CONSTRUCTION AND PRE-ENGINEERING/PRE-ARCHITECTURE

Type of Space	Units	Area Per Unit	Student Capacity Per Unit	Total Capacity	Total Area (sq. ft.)
I. **Instructional (Specialized)**					
Wood & Wood Related Shop Complex	1	10,400	80	80	10,400
Wood Finishing Shop	1	600	—	—	600
Fiberglass Shop	1	800	—	—	800
Tool House	1	500	—	—	500[a]
Greenhouse	1	5,000	20	20	(5,000)[a]
Hot and Cold Beds	2	1,000	—	—	2,000[a]
Drafting Lab	1	1,600	40	40	1,600
Drafting Labs	2	1,200	30	60	2,400
Geodesy Lab	1	600	—	—	600
Construction Lab	1	1,200	40	40	1,200
Sub-Total	12			240	17,600
II. **Instructional (Non-Specialized)**					
General Classrooms	4	600	30	120	2,400
General Classrms.	2	800	40	80	1,600
Sub-Total	6			200	4,000

TABLE 19.4 (Cont'd)

SPACES REQUIRED FOR BUILDING CONSTRUCTION AND PRE-ENGINEERING/PRE-ARCHITECTURE

Type of Space	Units	Area Per Unit	Student Capacity Per Unit	Total Capacity	Total Area (sq. ft.)
III. Auxiliary					
Student Locker rm.	1	800	(160)	—	800
Lumber Storage	1	1,000	—	—	1,000
Sub Total	2				1,800
IV. Office					
Dept. Head Ofc.	1	150	—	—	150
Secretary's Ofc.	1	120	—	—	120
Day Faculty Ofcs.	16	80	—	—	1,280
Evening Fac. Spaces	14	20	—	—	280
Sub-Total	32				1,830
Totals	52	440			25,230

[a] Not considered as regular building space; therefore not included in totals.

Wood and Wood-Related Shop Complex

It is recommended that six activity zones or areas be designed within this area. These six zones and a description of the activities in each follow:

1. Carpentry Shop Zone.

   Approximately 40 students should be provided for in this general area. These students will be given instruction in general carpentry. Activities will include: building half-scale and full-scale wooden houses, practice in construction of house framing, building layout, framing, sheeting, roofing, installing insulation, sheetrocking and the other normal activities involved in construction of residences. Tools used in this area include hand saws, hammers, squares, crowbars, skillsaws, hammer-staplers, electric and hand drills, chisels, screwdrivers, automatic nailers, other normal carpentry tools and possibly air-driven carpentry tools. Projects will periodically be torn down for re-use of lumber.

2. Marine Carpentry Shop Zone.

   Approximately 20 students should be provided for in this general area. These students will be given instruction in marine carpentry and boat building. Activities will include layout and construction of full-scale boats (25-30 feet maximum), practice in boat repair and refinishing, limited practice in boat engine and electrical maintenance and repair. Tools used in this area include: hand saws, hammers, squares, crowbars, skillsaws, electric and hand drills, chisels, screwdrivers and other normal carpentery tools. While some projects will be torn down for re-use of materials, others will be completed and removed from the facility for sale or other use.

3. Cabinet and Millwork Shop Zone.

   Approximately 20 students should be provided for in this general area. These students will be given instruction in the planning and construction of cabinets, doors, windows, sashes, bucks, furniture and other mill items. Activities will include layout and construction of the above mentioned mill items. Tools used in this area include hand saws, hammers, squares, skillsaws, electric and hand drills, air-driven tools, screwdrivers and other normal carpentry tools. While some projects will be torn down for re-use of materials, others will be completed and removed from the facility for sale or other use.

4. Marine Lofting Zone.

   Approximately 420 square feet of space should be provided for this zone. This zone should have an aspect ratio of approximately 3:1. This zone may be designed in the form of a balcony over a portion of the Marine Carpentry Shop Zone in order to save floor space. Activities will include the full-scale layout of boats and their components. Floor area should be free and unbroken, since layout is accomplished at floor level. No furniture or special tools are anticipated for use in this area. Layout is accomplished on plywood panels which are nailed to the floor and periodically removed, stored or refinished for further use.

5. General Milling Area.

   Most of the heavy (usually floor mounted) machines such as bandsaws, circular saws, planers, routers, jointers, etc. which are from time to time used by the students in zones 1, 2 and 3, will be located in this zone. As this zone directly supports the activities in these three other zones, it should be physically connected to each. This connection should provide for the free flow of lumber (up to 16 lineal feet maximum) from this zone to each of the other three zones. Most of the wood used in the three zones will come from the wood storage area to this area for its initial milling or cutting. Due to the activities in this area, there should be provided a system for sawdust removal. In addition, there is a special need in this area for electrical power to support the anticipated machinery.

6. General Tool and Hardware Storage.

   This area should be designed for the general storage of certain handtools and for the general storing and dispensing of the hardware required by the instructional activities of zones 1, 2 and 3. Tools to be stored include saws, hammers, skillsaws, electric and hand drills, squares, soldering and welding equipment, and other normal carpentry and woodworking tools. Hardware to be stored and dispensed include nails, screws, hinges, locks, sash hardware, drawer pulls, cabinet latches and other similar items. Some form of security protection should be provided for this area by means of metal mesh walls or some other architectural means. There should be provided in this area a desk or counter-type check-out, with provision for an attendant to supervise the check-out of tools and the dispensing of and accounting for hardware.

Additional Remarks Concerning the Overall Space

Architectural design should take into consideration the following factors:

1. Many projects are nailed to, or otherwise attached to the floor.
2. The activities and projects require a higher than normal ceiling height.
3. Zones 5 and 6 each directly support the activities in Zones 1, 2 and 3, and thus should have a direct physical connection with these three zones. This connection should provide not only for the movement of individuals, but also for the transport of large and heavy materials as well.
4. Activities including reading plans, layout and design sawing, nail-

ing, the use of potentially dangerous machines and other activities require adequate lighting throughout the entire area.

5. The three instructional zones (1, 2 and 3) periodically turn out large and very heavy products which will be taken out of the facility and perhaps removed from the campus entirely.
6. Although most of the floor mounted machinery will be restricted to one zone, it can be expected that some electrical hand tools will be used throughout all zones, thus requiring electrical power.
7. The overall space should, as much as possible, reflect or resemble an actual, efficient and modern wood or mill shop, as is provided for industry.
8. This is a "high visibility" area.
9. Major tools required in this central area are as follows:

Quantity	Item
1	30-inch planer
1	24-inch planer
1	36-inch bandsaw
1	24-inch and/or 20-inch bandsaw
1	16-inch jointer
1	12-inch jointer
2	Mortising machines
2	Tenoners
2	Radial arm saws
1	Molder (stickler)
1	Air compressor
1	Drill press

Wood Finishing Shop

This space will be used for instruction and practice in sanding, rubbing, painting, varnishing and other activities related to the wood finishing of cabinets, furniture, doors, etc.

It is recommended that storage of approximately 100 square feet for paints, thinners, brushes and other materials be provided within this space. Other than Building and Fire Code requirements, there are no special requirements for windows, doors, ceiling, walls or floors. Architectural design should anticipate the need for forced air removal due to the nature of the activities. Provisions should also be made for compressed air for spray painting and cleaning.

Fiberglass Shop

This space will be used for instruction and practice in fiberglass covering, molding, finishing, etc.

It is recommended that storage of approximately 100 square feet for chemicals and materials be provided within this space. Other than building and fire code requirements, there are no special requirements for windows, doors, ceiling, walls or floors. Architectural design should anticipate the need for forced air removal due to the nature of the activities and the possibility that one or more boats will be brought into the shop for fiberglassing.

Greenhouse

This space will be used for instruction and practice in the selection, cultivation, growing, cutting, grafting and general care of plants.

It is recommended that this facility be provided with an area of approximately 400 square feet where tables and student-chairs could be located. This zone would serve for lecture activities, flower arranging and simulated customer-contact activities. The remaining recommended area should be designed as much as possible as a standard nursery greenhouse (or greenhouses), with pot-shelves, floor-plot areas, and raised flats and tool and equipment storage.

Drafting Laboratories

These laboratories will be used for instruction and practice in drawing, drafting and estimating.

It is recommended that two of these spaces be provided with 30 standard-size student drafting tables and adjustable drafting stools. The third lab should contain 40 such stations. Architectural planning should anticipate the need for high-level light illumination. Approximately 30 lineal feet of chalkboard should be provided. Approximately 8 lineal feet of tackboard should be provided. Provision should be made for increased use of electrical drafting aids. The instructor station will consist of a standard drafting table and chair. This space should be designed for audio-visual and educational TV presentations; full RAMP facilities including in-room TV will be used. There are no special window, door or acoustical requirements.

Construction Laboratory

This laboratory will be used for "hands on" instruction involving construction materials, small testing gauges, devices and machines.

It is recommended that this space be provided with extensive shelves and lockable wall cabinets for the storage of small testing equipment, mock-up building components, i.e. model beams, columns, trusses, roof sections, wall sections, etc., and building material samples. Activities in this space will include the testing of building materials for strength, durability, flammability, corrosiveness, etc. In addition, instructional activities will also include the examination by students of sample building materials. This space should be planned for audio-visual and educational TV presentations. Architectural planning should anticipate the need for a utility-type floor covering. Approximately 16 lineal feet of chalkboard should be provided as well as approximately 8 lineal feet of tackboard. Ten 4-student strip tables and 40 student chairs should be provided. The instructor's station should consist of a standard 4′ x 6′ table with chair.

General Classrooms

These classrooms will be used for generalized instruction, involving mainly lecture, discussion, audio-visual and ETV activities.

It is recommended that at least two of the 30-student station and one of the 40-student station classrooms be equipped with standard strip tables and student chairs. The remaining classrooms may be equipped with standard student tablet-arm chairs. In all cases, the instructor station should consist of a standard table and chair. Each space should be designed for audio-visual and educational TV presentations, utilizing the RAMP facilities.

Geodesy Laboratory

This space will be used by all surveying classes. It primarily is used for instrument storage. It should contain 40 instrument lockers, storage for plane tables, rods, poles and stakes. It should have chalkboard, corkboard and an overhead projector. A table for cleaning and repair of instruments should be provided. This room must be accessible to the outside. It must allow for in-room instrument set-up. Only incidental seating need be provided, since demonstrations conducted here will be of the "stand-up" variety.

For use by surveying students, a bench-mark should be provided on campus.

Locker Room

This space should provide for 160 standard student lockers for storing work uniforms or street clothes of those enrolled in the program.

Lumber Storage Area

The lumber storage area should be physically associated with the woodshop complex. Racks for storage of plywood panels, framing members, structural timbers, finished lumber and millwork should be provided. Consideration should be given to the problems of fire protection, delivery access and maneuverability of the stock.

Faculty Offices
Full-Line Faculty

Each faculty office should contain approximately 80 square feet of space and should accommodate a single faculty member. Each office should be equipped with a double pedestal desk, office chair, 2 side chairs, a clothes rack and filing cabinets. Each office should be equipped with telephone and at least 2 electrical outlets. All offices should be carpeted.

Office space should also be provided for secretarial services. The space should be equipped with secretaries' desks, chairs, work table, filing cabinets and telephone and electrical outlets for the number of secretaries needed. Offices should be carpeted.

Part-time Faculty

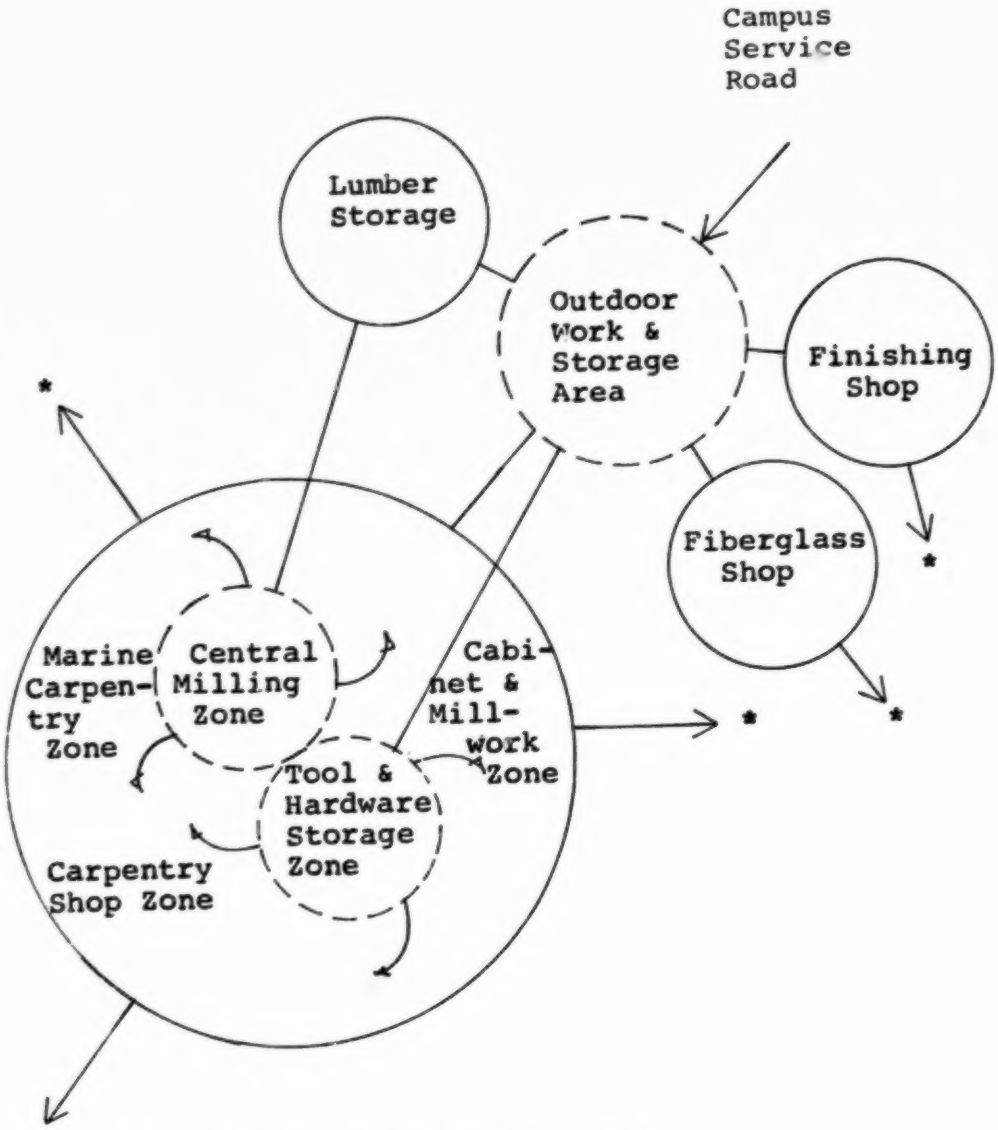
Part-time faculty should be provided 20 square feet for each member for a study carrel work space with overhead book shelf and chair. Individual lockers should be built into the space for teaching materials, books, etc.

Relationships

Figure 19.2 shows the relationships desirable between the zones of the woodshop complex, discussed earlier. Figure 19.3 indicates relationships within the facilities for Building Construction. Figure 19.4 indicates relationships between these facilities and other facilities on campus.

FIGURE 19.2

RELATIONSHIP OF ZONES WITHIN AND ADJOINING THE WOOD AND WOOD-RELATED SHOP COMPLEX


Campus Service Road
Lumber Storage
Outdoor Work & Storage Area
Finishing Shop
Fiberglass Shop
Marine Carpentry Zone
Central Milling Zone
Cabinet & Millwork Zone
Tool & Hardware Storage Zone
Carpentry Shop Zone
*
*
*
*
*

*Physical products come from these areas. Exits required.

FIGURE 19.3

RELATIONSHIPS OF SPACES WITHIN BUILDING CONSTRUCTION, PRE-ENGINEERING AND PRE-ARCHITECTURE

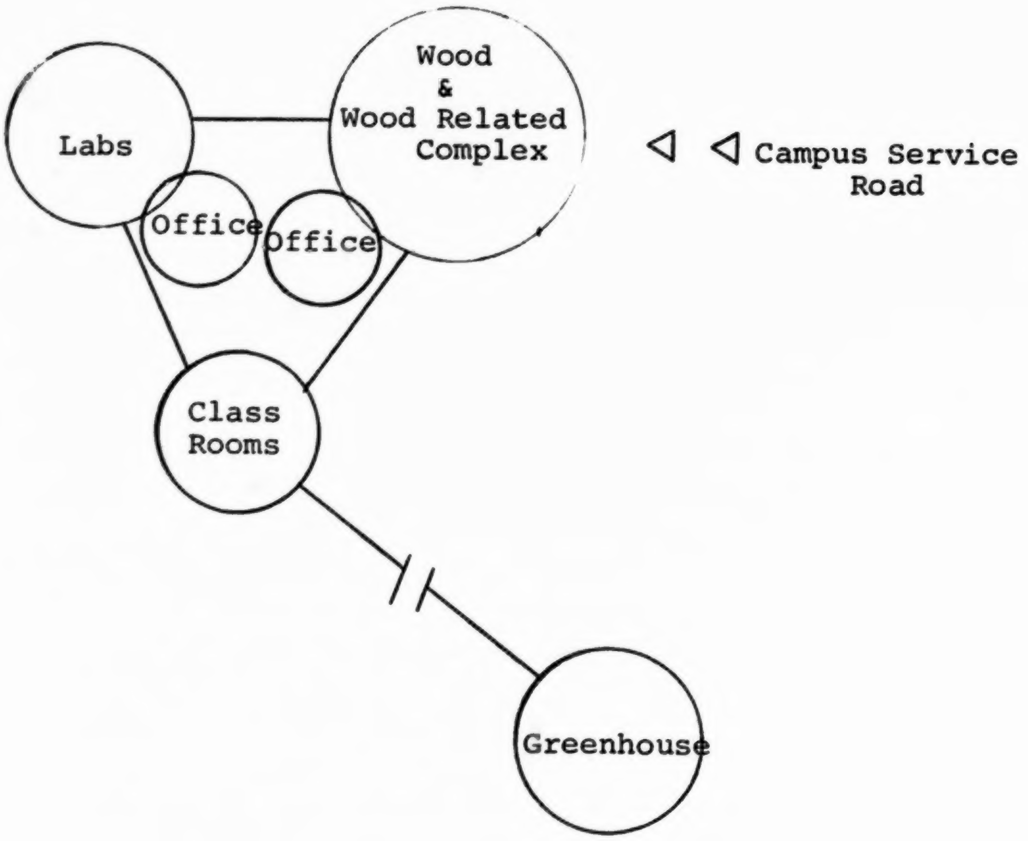
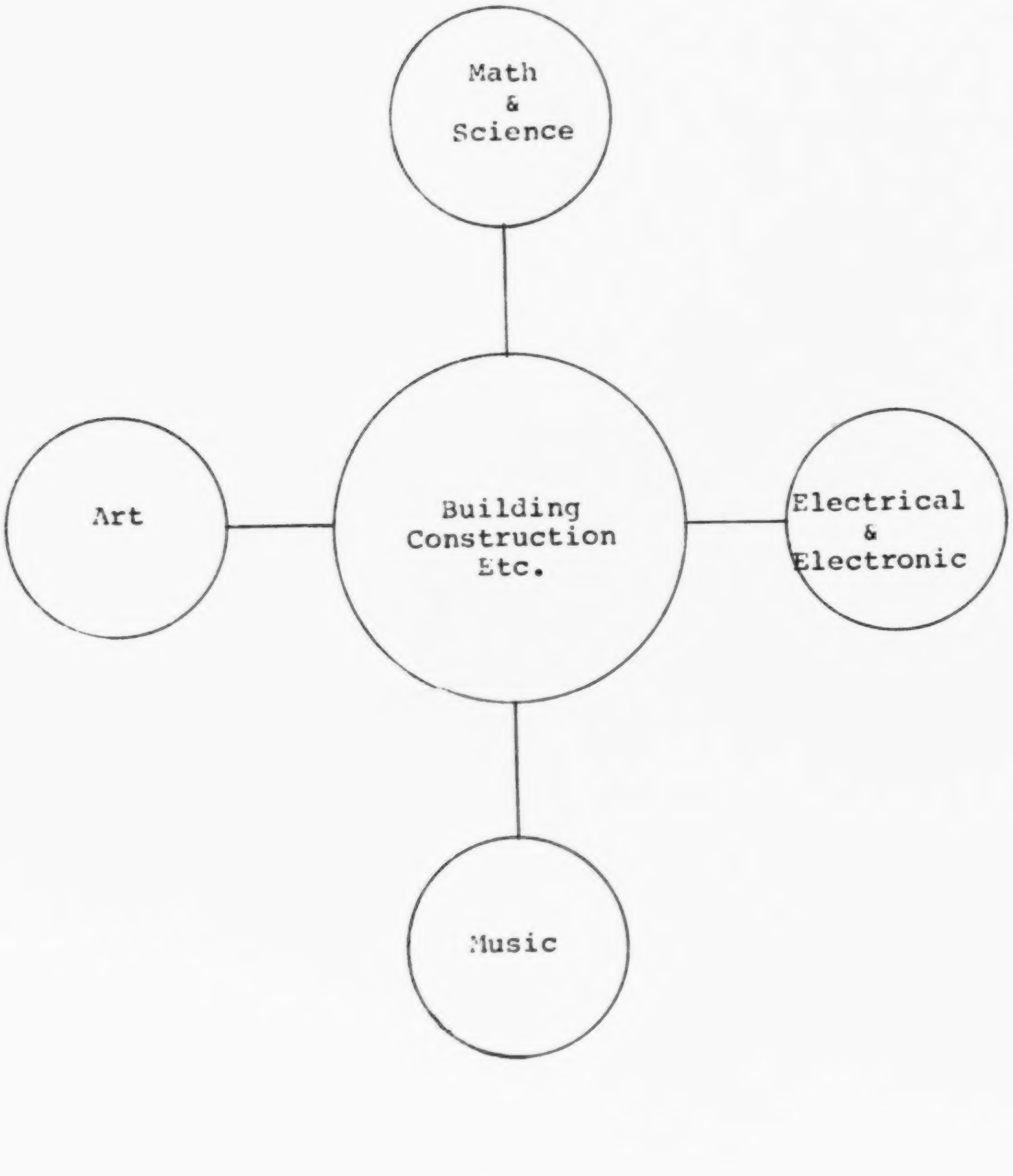

Wood
&
Wood Related
Complex
Labs
Campus Service
Road
Office
Office
Class
Rooms
Greenhouse

FIGURE 19.4

RELATIONSHIP OF THE FACILITIES OF BUILDING CONSTRUCTION, PRE-ENGINEERING AND PRE-ARCHITECTURE WITH OTHER PROGRAM FACILITIES


Math
&
Science
Art
Building
Construction
Etc.
Electrical
&
Electronic
Music

XX

FACILITIES FOR THE PARAMEDICAL OCCUPATIONS

Philosophy and Objectives

The College will provide courses of instruction designed to prepare individuals for a variety of occupations in the health-related fields. Graduates of these curricula are prepared to give vital support to professional workers in the general health area.

The role of the College will primarily be that of providing the necessary basic classroom and laboratory instruction; cooperative arrangements with other community agencies must be made in order to provide the patient-centered clinical experiences which are associated with this occupational area. A secondary responsibility of the College, therefore, is the coordination and articulation of its own programs with those of the community agencies concerned.

National, regional and local needs for workers in all the paramedical occupations are now urgent and are projected to increase during the foreseeable future. It is impossible to establish priorities in an area in which personnel at all levels and in all specialties are in such critically short supply. Hence, the College will assume responsibility for giving instruction in a wide spectrum of paramedical specialties.

Curricula and Courses

Four major educational streams are provided within the instructional programs related to the paramedical area. These include programs for the preparation of (1) nursing personnel, (2) medical technicians, (3) medical assistants and (4) dental assistants. The programs for preparation of specialists within each of these four main categories are implied by the entries in Table 20.1; the table also gives estimates of the enrollment in each specialty.

Curricular areas which may be closely allied with these areas of specialization include the following:

1. Secretarial Science
2. Life Science
3. Physical Education
4. Social Science
5. Library Science
6. Family Life Education

TABLE 20.1

PARAMEDICAL SPECIALTIES FOR WHICH PREPARATORY INSTRUCTION IS TO BE OFFERED AT SEATTLE COMMUNITY COLLEGE, NORTH CAMPUS

Area and Speciality	Duration of Program	Estimated Enrollment
Nursing Personnel		
Registered Nurse	2 years	100
Licensed Practical Nurse	1 year	80
Nurses Aides	8 weeks	80[a]
Nursing Unit Ward Secretary	6-9 months	40
Medical Technicians		
X-ray Technicians	2 years	20
Medical Assistants		
Certified Lab Assistant	1 year	15
Medical Assistant	1 year	20
Medical Secretary[b]	2 years	40
Medical Emergency Assistant	6 months	10
Medical Records Technician[b]	2 years	20
Inhalation Therapist	1 year	10
Operating Room Assistant	6-9 months	20
Occupational Therapy Asst.	1 year	10
Physical Therapy Assistant	1 year	10
Dental Assistants		
Dental Hygienist	2 years	20
Dental Assistant	1 year	20
Dental Lab Technician	2 years	15

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[a] Four groups annually of 20 each, for a total head count of 80 per year; FTE of 20.

[b] Coupled program; offered in cooperation with office occupations.

Teaching and Learning Activities

Teacher activities include lecturing, demonstrating devices and techniques, using chalkboard, using visuals and audio-visuals, using the overhead projector, answering questions, giving tutorial assistance, leading discussions, supervising performance and information tests, coordinating school-based activities with other-based activities, and supervising students performing in clinical environments.

Student activities include listening to lectures, taking notes, observing demonstrations, visuals and audio-visuals, asking questions, participating in discussions, practicing the use of devices and techniques, working on individual and team projects, performing laboratory exercises, taking performance and information tests and interning in clinical environments.

Emerging Concepts and Developing Trends

Rapid technological advances in medicine as well as increases in the depth of medical knowledge signal important changes in the health-related occupations. Intra-arterial photomicrography, computer assisted encephalographic analysis and "whole-patient" monitoring systems are but a few examples of recent significant technological advances. Contemporary research in immunology, genetic codes and arrest of degenerative processes are just samples of recent exciting discoveries at the frontiers of medical knowledge. These advances and discoveries have implications for the medical profession.

Certain social changes, already begun, can be predicted also to alter medical practice. Medicare, obviously, will have significant impact upon the profession. Under the auspices of this and other Federal Government programs, many individuals not formerly able to afford them can and will avail themselves of health services. A general rise in the national standard of living also implies increased demands for medical attentions which, in less affluent times, might have been assigned secondary priorities.

The increases in sophistication of both medical knowledge and practice coupled with increased demands for medical service inevitably will create shortages of health-related personnel and will necessitate for most purposes the use of *teams* consisting of both professional and semi-professional workers. The use of such medical teams is perhaps the most significant development in contemporary medicine, and the trend to do so will accelerate. The challenge and opportunity uniquely afforded the comprehensive community college is to provide education for the semi-professional members of such teams.

In order to meet this challenge and to adapt its products to the changing and evolving field of medical practice, occupational education for paramedical personnel is itself in the process of change. The evolution from single-instructor concepts to team-instruction methods is but one example. Another notable trend is visible in curriculum structure: those skills and concepts which are generalizable to an entire cluster of occupations are considered the most appropriate for occupational curricula. Such generalizability is highly to be desired, for it is realized that a primary objective of education is the development of adaptability in individuals. Smilarly, the facilities supporting education must reflect these changes, encouraging multiple-use, discouraging high degrees of specificity and allowing adaptation to the purposes of the as yet dimly perceived future.

Student Groups

Number of Students and Utilization of Facilities

One estimate of the student enrollment in paramedical curricula has been given in Table 20.1.A more relevant projection of the total personnel to be associated with this college unit is given in Table 20.2. This table shows an "adjusted" student load and an estimate of faculty requirements.

TABLE 20.2

PERSONNEL ASSOCIATED WITH THE PARAMEDICAL OCCUPATIONS

Area	Students	Faculty
Nursing Personnel	180[a]	10
Medical Technicians	20	1
Medical Assistants	125[b]	4
Dental Assistants	55	2
Total	380	17

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[a] Reduced to FTE by adjusting for effects of short courses (Nurse Aide Program) and coupled programs.

[b] Reduced to FTE by adjusting for coupled programs. Students in such programs are expected to spend only one-half their time in the paramedical area; the other half will be in the other college areas.

A second analysis of student population, by duration of program, is given in Table 20.3; in this table, the students in associate degree programs of two year's length, in certificate programs of one year's length, and in short courses are listed, along with the projected usage of facilities in clock hours per day. These projections are based on the following assumptions: (1) associate degree students will earn approximately one-half of their credits outside the area of their specialties; (2) certificate students will spend one-fourth of their pre-clinical time in other college units; and (3) all students are expected to spend an appreciable fraction of the total time devoted to their specialty in clinical practice in facilities at off-campus locations, and while this fraction varies with the program, this time has a range from one-fourth to three-fourths. All these assumptions are reflected in the projections given.

TABLE 20.3

PERSONNEL ANALYSIS BY DURATION OF PROGRAM, SHOWING APPROXIMATE USAGE OF PARAMEDICAL FACILITIES

Duration	Equivalent Number of Students	Mean Daily Hrs./Stu. in Class	Mean Daily Hrs./Stu. in Lab.	FTE Class Stations	FTE Lab. Stations
2 years[a]	185	2	1	62	31
1 year[b]	195	1	3	35	97
8 weeks[c]	20	—	4	—	16
Totals	400			97	144

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[a] Includes one-half of FTE in coupled programs.
[b] Includes 6 month and 9 month programs.
[c] FTE: 80 enrolled per year with 20 each term.

Some of the implications of Table 20.3 are that approximately 100 student stations in classrooms and approximately 150 student stations in laboratories should be provided.

Further, the table implies that faculty spaces as follows should be provided:

1	Administrative Office	150 sq. ft.
1	Reception Area	120 sq. ft.
16	Faculty Offices, 80 sq. ft. each	1,280 sq. ft.
1	Faculty Dressing Room	100 sq. ft.
1	Faculty Toilet	80 sq. ft.
1	Faculty Work Room	300 sq. ft.
12	Part-time Faculty Spaces, 20 sq. ft. each	240 sq. ft.
	Total	2,270 sq. ft.

In addition to the faculty offices, counseling spaces are recommended. The peculiar nature of the student-instructor relationship in this area calls for considerable individual counseling. The facilities must allow for counseling of individuals or small groups. Two seminar rooms of 240 square feet each and a conference room of approximately 120 square feet will provide for this necessary function. These spaces should be equipped for reception of RAMP services.

Characteristics of Classes and Students

Class sizes are expected to be 20 in most courses; however, the nature of the clinical experiences to be scheduled usually requires that groups of no more than 10 students be assigned to a clinical facility at one time. Hence, small groups may be scheduled in laboratories, matching other small groups scheduled for off-campus facilities.

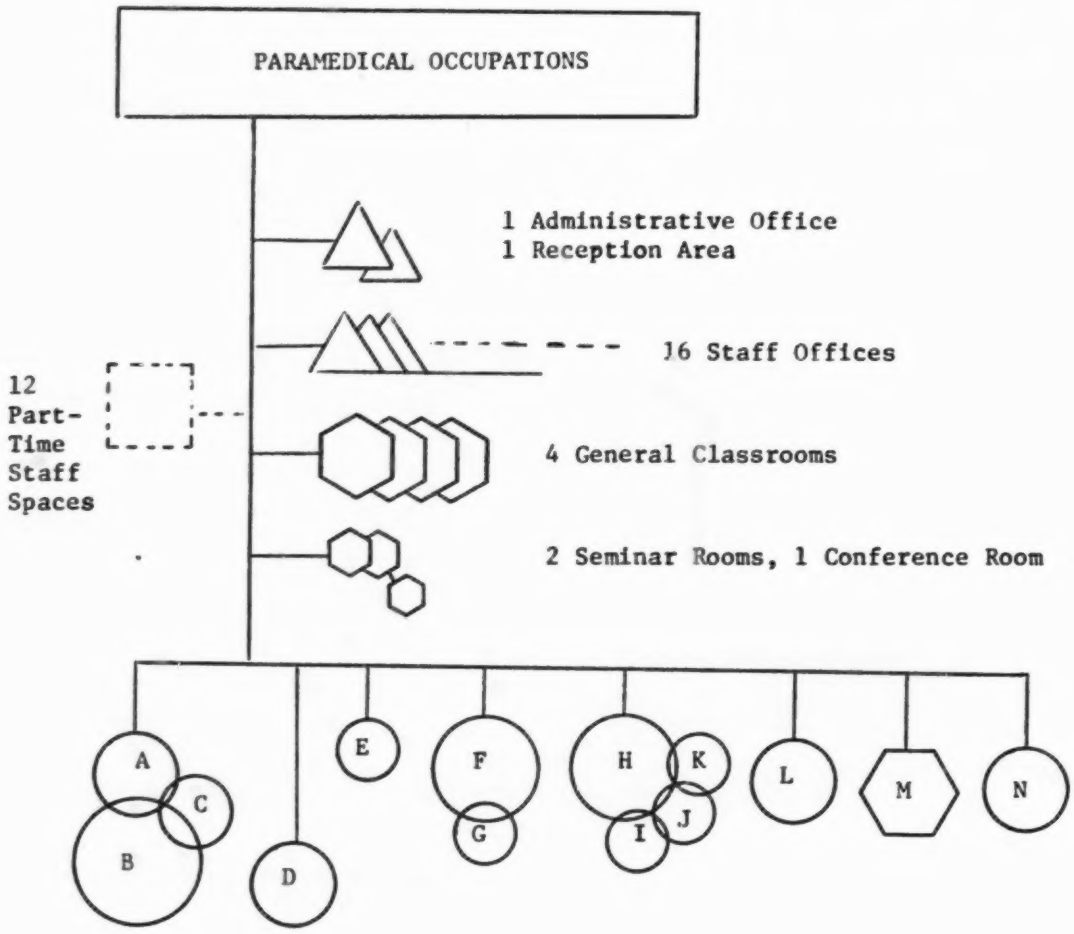
The clientele of the paramedical programs largely will be women, although men will enroll in the medical technician and medical assistant programs. Students in short courses may tend to be marginal, but those enrolled in certificate and associate degree programs are expected to be representative of the college enrollment as a whole.

Space Components of the Instructional Program

Figure 20.1 suggests the types and relationships of the specialized spaces necessary to implement the instructional programs in the paramedical occupations. Descriptions of these spaces appear later in this document. A brief description of each space appears in Table 20.4 and greater detail appears in the following paragraphs.

FIGURE 20.1

SPACES RECOMMENDED TO IMPLEMENT THE INSTRUCTIONAL PROGRAM IN PARAMEDICAL OCCUPATIONS


PARAMEDICAL OCCUPATIONS
1 Administrative Office
1 Reception Area
16 Staff Offices
12 Part-Time Staff Spaces
4 General Classrooms
2 Seminar Rooms, 1 Conference Room
A
B
C
D
E
F
G
H
I
J
K
L
M
N

A. Nursing Arts Laboratory
B. Nursing Arts Laboratory
C. Utility Area
D. Lockers and Dressing Rooms
E. Technical Reference Area
F. Medical Laboratory Procedures
G. Medical Lab Storage
H. Dental Practice Laboratory
I. Storage for Dental Lab
J. Dental X-ray Room
K. X-ray Dark Room
L. Dental Technology Lab
M. Demonstration-Lecture Space
N. Occupational-Physical Therapy Lab

TABLE 20.4

CHARACTERISTICS OF SPECIALIZED SPACES ASSOCIATED WITH THE PARAMEDICAL OCCUPATIONS

Code	Space Description	No. of Units	Student Stations per Unit	Instructor Stations per Unit	Approx. Area (sq. ft.)	
					Unit	Total
A	Nursing Arts Lab	1	24	1	1,600	1,200
B	Nursing Arts Lab with Demonstration Area	1	24	1		2,000
C	Utility Area	1	—	—		400
D	Lockers & Dressing Area	2	—	—	240	480
E	Technical References	1	—	—		150
F	Medical Lab Procedures	1	16	1		1,000
G	Medical Lab Storage	1	—	—		200
H	Dental Practice Laboratory	1	20	1		1,400
I	Storage for Dental Laboratory	1	—	—		150
J	Dental X-ray Room	1	4	—		80
K	X-Ray Dark Room	1	4	—		80
L	Dental Technology Laboratory	1	16	1		1,200
M	Demonstration-Lecture Space	1	(50)	2		1,200
N	Occupational-Physical Therapy	1	20	1		900
	Totals		128[a]			10,440[b]

---

[a] Includes laboratory stations only; the demonstration theatre has not been included

[b] Total includes Demonstration Theater.

A. **Nursing Arts Laboratory**—One unit of 1,200 square feet which should contain 2 hospital beds and the auxiliary equipment generally associated with a bed, including a bedside table, over-bed table, privacy screens, call system, etc. The room should be provided with chalkboard and corkboard and the other classroom facilities for the RN program. Portable linen storage units are recommended. The room should be readily accessible to the utility area, described below, and should be close to the dressing area. Floors should be easily cleanable. Hospital conditions should be simulated as much as possible.

B. **Nursing Arts Laboratory with Demonstration Area**—One unit of 2,000 square feet. The unit should contain 12 hospital beds and associated equipment. Cubicle curtains should be provided. It should be accessible to utility area and dressing area. Part of the space should be devoted to classroom-recitation activities and should have seats for 24 students and an instructor station. Full RAMP services should be available to this laboratory. Students will undress and dress in this area. In-room storage for teaching aids, supplies and laboratory equipment should be provided. This unit is projected to be used primarily in short courses and as such, will almost fully contain certain programs.

C. **Utility Area**—The utility area should be accessible to all nursing arts laboratories and also should have ingress from the outside for receiving delivery of materials, especially linens. The space should be clearly divided into two areas, one "clean" and one "dirty." Some physical demarkation, such as a half-wall, can be used to accomplish this purpose, or the placement of equipment can accomplish the required delineation. Linen storage should be provided here. A mediprep station and a nurses' station, if not included here, must appear somewhere in the facility. The room should have a deep sink and a sterilizer.

D. **Lockers and Dressing Area**—Two units (one for women, one for men) with a total area of 480 square feet. Units should contain minimal toilet facilities. Lockers for storage of personal clothing and/or uniforms should be provided. Approximately three-quarters of the space should be devoted to "women."

E. **Technical References**—A "quick reference" resource for students in the paramedical area. The space should be devoted to storage of reference works and a small collection of relevant bibliographic materials. Ideally, this room will be located near the reception area for this college unit, in order that the secretary assigned here can supervise the operation of the facility. Only a few reading stations should be provided; this facility is *not* to duplicate the IRC but merely to supplement it by providing close to the origin of a question resources for locating its answer. The collection will be maintained by the IRC.

F. **Medical Lab Procedures**—A unit of 1,000 square feet with stations for 16 students. The equipment must include lab benches with sinks.

in-room storage for laboratory apparatus and supplies and laboratory stools for each student station. Chalkboard and corkboard should be provided. Adequate electrical service must be provided to each bench. Each bench should contain locked drawers assignable to individual students. Full RAMP services should be provided for. This is a "high visibility" area.

G. **Medical Lab Storage**—This space is for storage of apparatus and equipment infrequently used in the associated laboratory. It must be contiguous to and accessible from room F just described. Some dust-proof storage should be provided.

H. **Dental Practice Laboratory**—A unit for multipurpose use in Dental Assistant and Dental Hygienist programs. It should contain five operating units with chairs, lights and two stools per chair. A mobile cabinet should be provided for each chair, and one mobile X-ray unit should be provided. Each chair should have an oral evacuator and an adjacent sink. One autoclave and one dental amalgamator should be provided for the laboratory. An assortment of sterilizers (oil, water, hot air, ultraviolet) should appear. A simulated reception area, with two desks, should be provided in the room. Typewriters, files and the other appurtenances of a dentist's office should be associated. This laboratory should be easily accessible to the storage room, the X-ray room and the dark room described below. This is a "high visibility" area.

I. **Storage for Dental Laboratory**—This unit should contain shelving and custom cabinets for the storage of equipment and supplies used in the Dental Practice Laboratory. It should be adjacent to and accessible from that laboratory.

J. **Dental X-ray Room**—This space should be lead lined for protection of personnel outside, should be fitted with a lead lined door having a lead-glass panel and should be adjacent to the section of the Dental Practice Laboratory which contains the dental chairs. The room should also be near the dark room. It is to be equipped with an X-ray machine and a dentist's chair. The usual auxiliary equipment should be associated with the chair, plus an illuminator for X-ray film and a dispenser for film.

K. **X-Ray Dark Room**—This unit must be light tight, with external warning signal. It should be equipped with a stainless steel sink and counter, a developing tank, softlight, dental film viewer, film drier, timer, hangers for film and storage space for chemicals and supplies.

L. **Dental Technology Laboratory**—This laboratory unit should contain benches with work stations for 16 students. A side counter should be provided for holding certain specialized equipment, including a casting machine, curing unit, polishing lathes, porcelain furnaces, burn out ovens, etc. One environmental problem to be overcome is that of dust from plaster molds; a second is that of metal filings from the lathes and polishing machines. It is suggested that a vacuum system be incorporated into the benches to help in the solution of these problems. Storage space under the benches and along the walls should be provided. Each work station should have gas, air, water and 120V AC electric service. Each work station should have an adjustable stool with back. Illumination levels at bench top height should be 80 ft.-candles.

M. **Demonstration-Lecture Space**—This unit is the core of the paramedical area. It has multiple uses and is essential to the instructional program in all these occupational specialties. It is to be adaptable to lecture-demonstrations in (1) nursing procedures, (2) dental procedures and (3) X-ray procedures. A stage (or stages) for each major area should be provided. In-room TV will be employed. Hence, the stage should have focused on it two closed circuit television cameras for magnifying details of the procedures being demonstrated. Viewscreens throughout the room will make all parts of the demonstration clear. It is suggested that viewscreens be paired, each member of such sets to receive the images from different cameras. Full RAMP facilities should be available to this room for initiation as well as reception. Closed-circuit telecasts originating here will be made available in remote campus locations. Student seating should be comfortable, with good provision for note-taking; strip tables may be one possibility. Student chairs, however, must be able to focus on different stages if more than one is used. Light control is essential. Storage spaces for the various props and demonstration apparatus must be provided. Stage area(s) must be large enough to contain a complete hospital bed with associated equipment and furniture, or a complete dental operatory, or X-ray gear of all sorts. Chalkboard, corkboard, overhead projection and equipment for multi-media presentations should be incorporated into the design. A large area presents acoustical problems and line-of-sight problems which must be solved. Carpeting is recommended for the seating area, but a smooth, hard surface is desirable on the stage area(s) in order that mobile equipment can be easily set up. A sink and water supply should be provided.

N. **Occupational-Physical Therapy**—A multipurpose unit. It is to be furnished with tables and student chairs and have storage for a limited amount of therapy equipment. (Items such as whirlpool baths will be available in the gymnasium or in the clinical facility, and items such as parallel bars, rings and weights will be available in the gymnasium. Smaller items such as crutches and walkers or hand tools, looms, crafts equipment and the like will be provided.) This is a "high visibility" area. RAMP facilities should be provided. This unit may be shared with other college units, especially those concerned with first aid, resuscitation and other emergency procedures.

O. **Faculty Dressing Room**—This area should be equipped with lockers for uniforms and or street clothes. Approximately 30 lockers are required. A full-length mirror, a bench and two chairs will satisfy furniture requirements. This space can be located contiguous to the faculty toilet.

P. **Faculty Work Room**—This space is to provide support for the instructional program. Faculty members will prepare visual aids, tests, make-up schedules for clinical experiences and do similar tasks here. Counter and wall cabinets, two 4′ x 6′ work tables, chalkboard, corkboard and 12 chairs should be provided.

Q. **Conference Room**—This space of 120 square feet is to be used for individual or small group counseling. It should be equipped with a table, six chairs, chalkboard, corkboard and should have RAMP services.

R. **Seminar Rooms**—Spaces for 12 student stations each, these areas should contain conference tables, 12 student chairs each, chalkboard, corkboard and in-room storage. RAMP services should be available. These spaces will be used primarily for "briefing" and "de-briefing" activities related to clinical experiences.

Additional Space Needs of Paramedical Students

In addition to the specialized spaces described in the foregoing, students in the paramedical occupations areas will regularly be scheduled into spaces ordinarily assigned to other college units. Table 20.5 lists those spaces and gives estimates of the number of clock hours per week, such facilities will be utilized by paramedical students. It is essential that adequate provision be made in the associated areas for the utilization demand of these students.

Relationships Between Spaces

Figure 20.2 indicates some desirable relationships between the spaces recommended for the Paramedical Occupations. Figure 20.3 indicates desirable relationships between the spaces of this unit and other spaces on campus.

TABLE 20.5

SPACES NOT INCLUDED IN THE PARAMEDICAL UNIT WHICH PARAMEDICAL STUDENTS ARE PROJECTED TO OCCUPY REGULARLY, WITH PROJECTED CLOCK HOUR USAGE PER WEEK

Type of Space	Units[a]	Clock Hours/Week
Communications Classroom	1	21
Psychology Classroom	1	25
Biology Classroom	1	17
Biology Laboratory	1	24
Physical Education Facilities	—	8
Chemistry Classroom	1	14
Chemistry Laboratory	1	17
Physics Classroom	1	6
Physics Laboratory	1	6
Home Economics Classroom	1	12
Humanities Classroom	1	25
Social Science Classroom	1	29
Mathematics Classroom	1	5
Typing Classroom	1	45

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[a] A "unit" is here considered to be a facility containing more than 20 but less than 40 student stations.

Furthermore, paramedical students will infrequently have use for certain other spaces; these are indicated in Table 20.6. While such spaces cannot be justified on the basis of paramedical needs alone, the paramedical area would share such facilities if they were available.

TABLE 20.6

SPACES WHICH PARAMEDICAL STUDENTS ARE PROJECTED TO OCCUPY OCCASIONALLY, WITH ESTIMATED USAGE

Type of Space	Usage
Lecture Theater for 200 students	3 hours per week
Lecture Theater for 500 students	1 period per quarter

Summary

Table 20.7 gives a summary of all the spaces recommended for the paramedical area. These items enclosed in parenthesis are spaces not assigned exclusively to the paramedical area but nevertheless are ones which are programmed for use here. Appropriate references and cross-references appear in the "code" column of the table.

TABLE 20.7

SUMMARY OF TOTAL SPACE NEEDS FOR THE PARAMEDICAL OCCUPATIONS

Type of Space	Code	No. of Units	Stu. Sta. per Unit	Sta. Ttl. Stu.	Approx. Area/Unit (sq. ft.)	Approx. Ttl. Area (sq. ft.)
Administrative office	Table 20.3ff	1	—	—	150	150
Reception Area	Table 20.3ff	1	—	—	120	120
Faculty Office	Table 20.3ff	16	—	—	80	1,280
Faculty Dressing Room	Table 20.3ff	1	—	—	100	100
Faculty Toilet	Table 20.3ff	1	—	—	80	80
Faculty Work Room	Table 20.3ff	1	—	—	300	300
General Classrms.	Figure 20.1	4	25	100	500	2,000
Seminar Rms.[a]	Figure 20.1	2	12	24	240	480
Conference Rm.	Figure 20.1	1	6	6	120	120
Part-time Staff Offices	Figure 20.1	12	—	—	20	240
Nursing Arts Lab	Table 20.4-A	1	24	24	1,200	1,200
Nursing Arts Demon.	Table 20.4-B	1	24	1	2,000	2,000
Utility Area	Table 20.4-C	1	—	—	400	400
Lockers/Dressing Area	Table 20.4-D	2	—	—	240	480
Technical References	Table 20.4-E	1	—	—	150	150
Medical Lab Procedures	Table 20.4-F	1	16	16	1,000	1,000

TABLE 20.7 (Cont'd)

SUMMARY OF TOTAL SPACE NEEDS FOR THE PARAMEDICAL OCCUPATIONS

Type of Space	Code	No. of Units	Stu. Sta. per Unit	Ttl. Stu. Sta.	Approx. Area/Unit (sq. ft.)	Approx. Ttl. Area (sq. ft.)
Medical Lab Storage	Table 20.4-G	1	—	—	200	200
Dental Practice Lab	Table 20.4-H	1	20	20	1,400	1,400
Dental Lab Storage	Table 20.4-I	1	—	—	150	150
Dental X-Ray Rm.	Table 20.4-J	1	4	4	80	80
X-Ray Dark Rm.	Table 20.4-K	1	4	4	80	80
Dental Technology Lab	Table 20.4-L	1	16	16	1,200	1,200
Demonstration-Lecture Space	Table 20.4-M	1	(50)	(50)	1,200	1,200
Occupational-Physical Therapy	Table 20.4-N	1	20	20	900	900
Typing Classroom[b]	Table 20.5	1	(30)	(30)	(1,400)	(1,400)
Other Classrooms[c]	Table 20.5	9	(30)	(270)	———	———
Lecture Theater	Table 20.6	1	(200)	(200)	———	———
Lecture Theater	Table 20.6	1	(500)	(500)	———	———
	Total					15,310[d]

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[a] To be used for group counseling prior to clinical experiences; interns will generally work in groups of 10-12 at clinical facilities.

[b] See Chapter XVII.

[c] See relevant chapters as implied by entries in Table 20.5.

[d] Total does not include typing classroom.

FIGURE 20.2

RELATIONSHIPS BETWEEN SPACES WITHIN FACILITIES
FOR THE PARAMEDICAL OCCUPATIONS

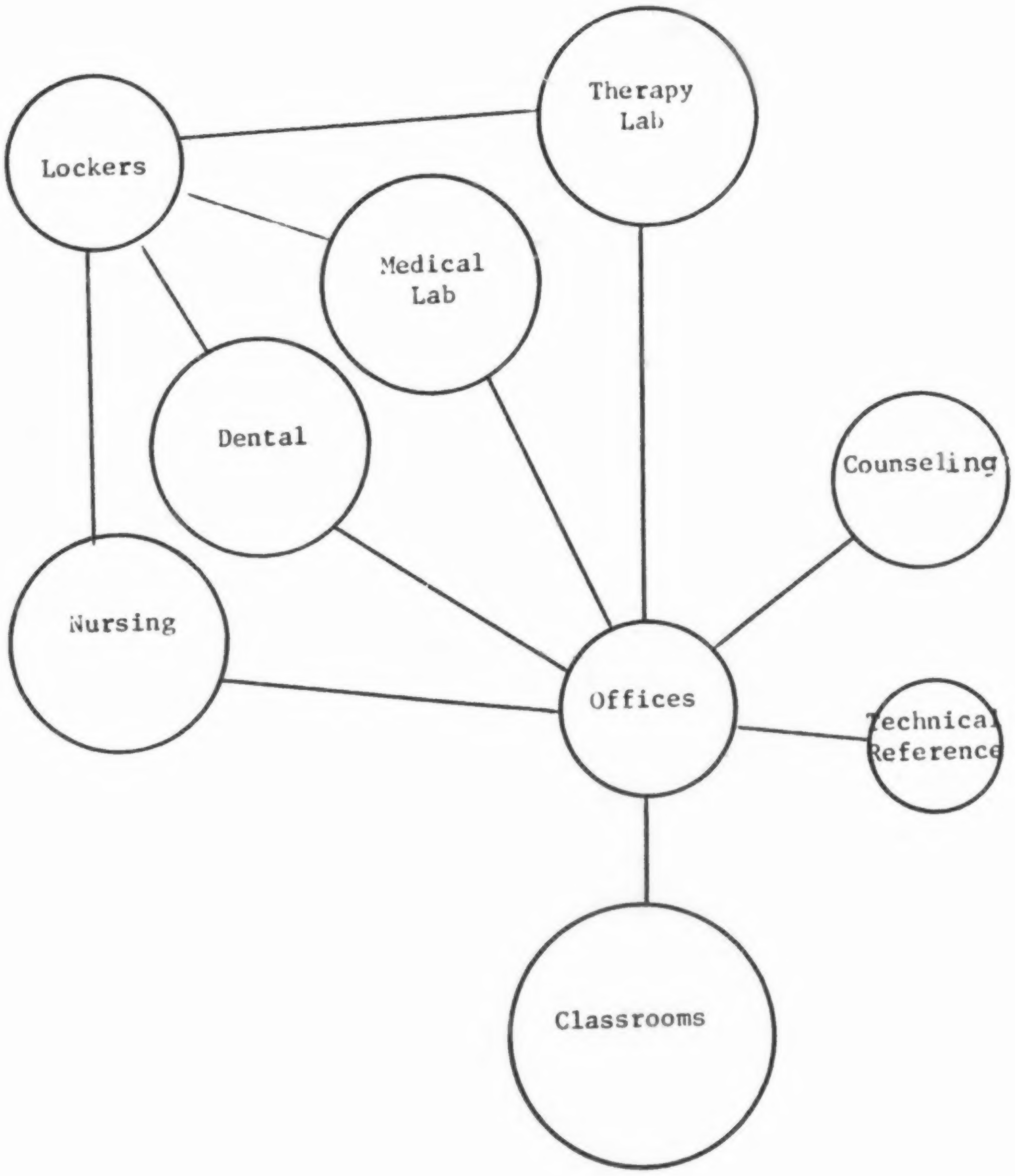
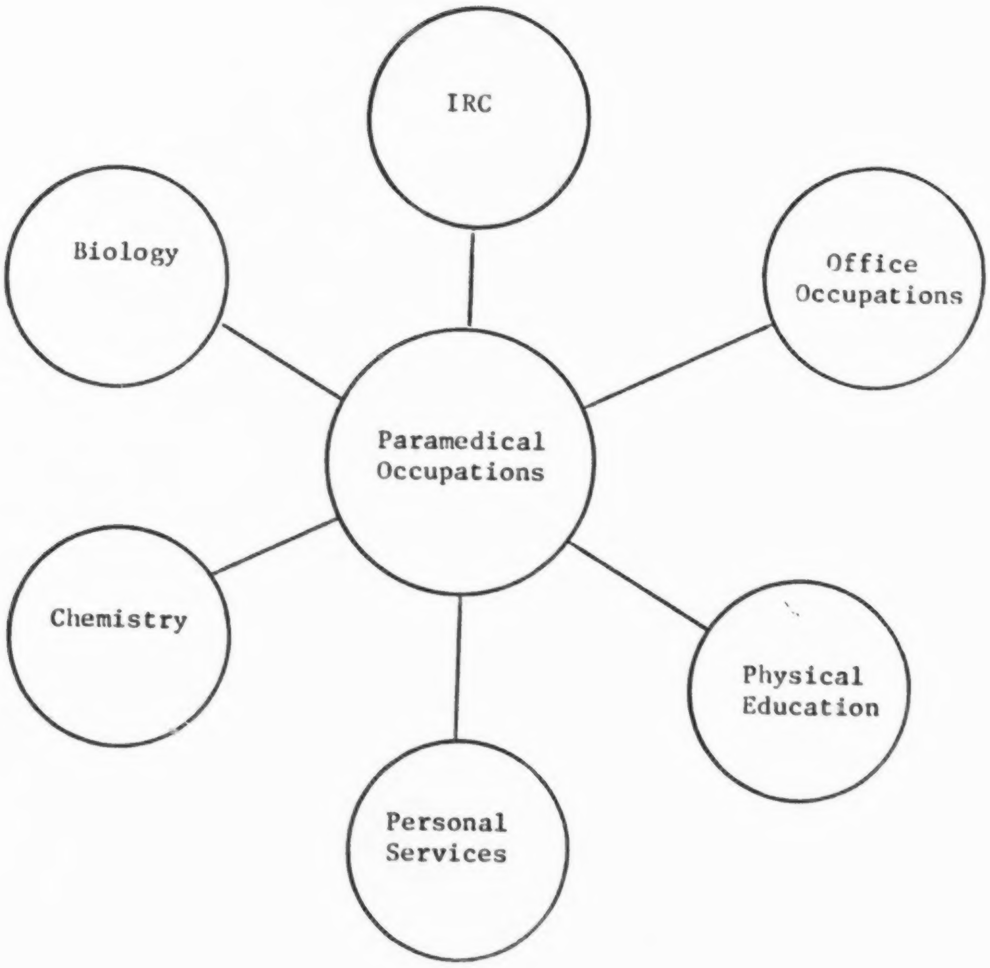

Therapy Lab
Lockers
Medical Lab
Dental
Counseling
Nursing
Offices
Technical Reference
Classrooms

FIGURE 20.3

RELATIONSHIP BETWEEN PARAMEDICAL FACILITIES
AND OTHER FACILITIES ON CAMPUS


IRC
Biology
Office Occupations
Paramedical Occupations
Chemistry
Physical Education
Personal Services

XXI

FOOD SERVICE AND RELATED OCCUPATIONS FACILITIES

The Total Program in Food Service

All college personnel will feel the impact of the program in Food Services and Related Occupations, for it is planned that this college unit will have responsibility not only for instruction in the Food Services area but also for operation of all the food service stations on the campus.

The various food service outlets on the campus are designed for the primary purpose of service to the clientele of the institution. Because the campus population will be diversified in its eating habits and its tastes in foods, a variety of kinds of food outlets have been planned. The existence of this variety of food service outlets provides the opportunity to give valuable instruction to students in the Food Service Occupational area by offering them internship experiences in these various food stations. While such internship potential is certainly secondary to the primary purpose of providing service to the campus population, the design of the food outlet stations and their supporting facilities hopefully will allow both purposes to be realized.

The Food Service Outlets

Figure 21.1 shows the kinds and number of food service outlets suggested for the college campus and indicates the relationship of the various teaching laboratories, i.e. kitchens to such food service outlets. Detailed educational specifications will appear elsewhere in this document for these food service outlets; however, since the nature of these outlets materially affect the nature of the facilities required to implement the instructional program in Food Services, some relevant comments are given here.

FIGURE 21-1

FOOD SERVICE STATIONS SUGGESTED FOR
SEATTLE COMMUNITY COLLEGE

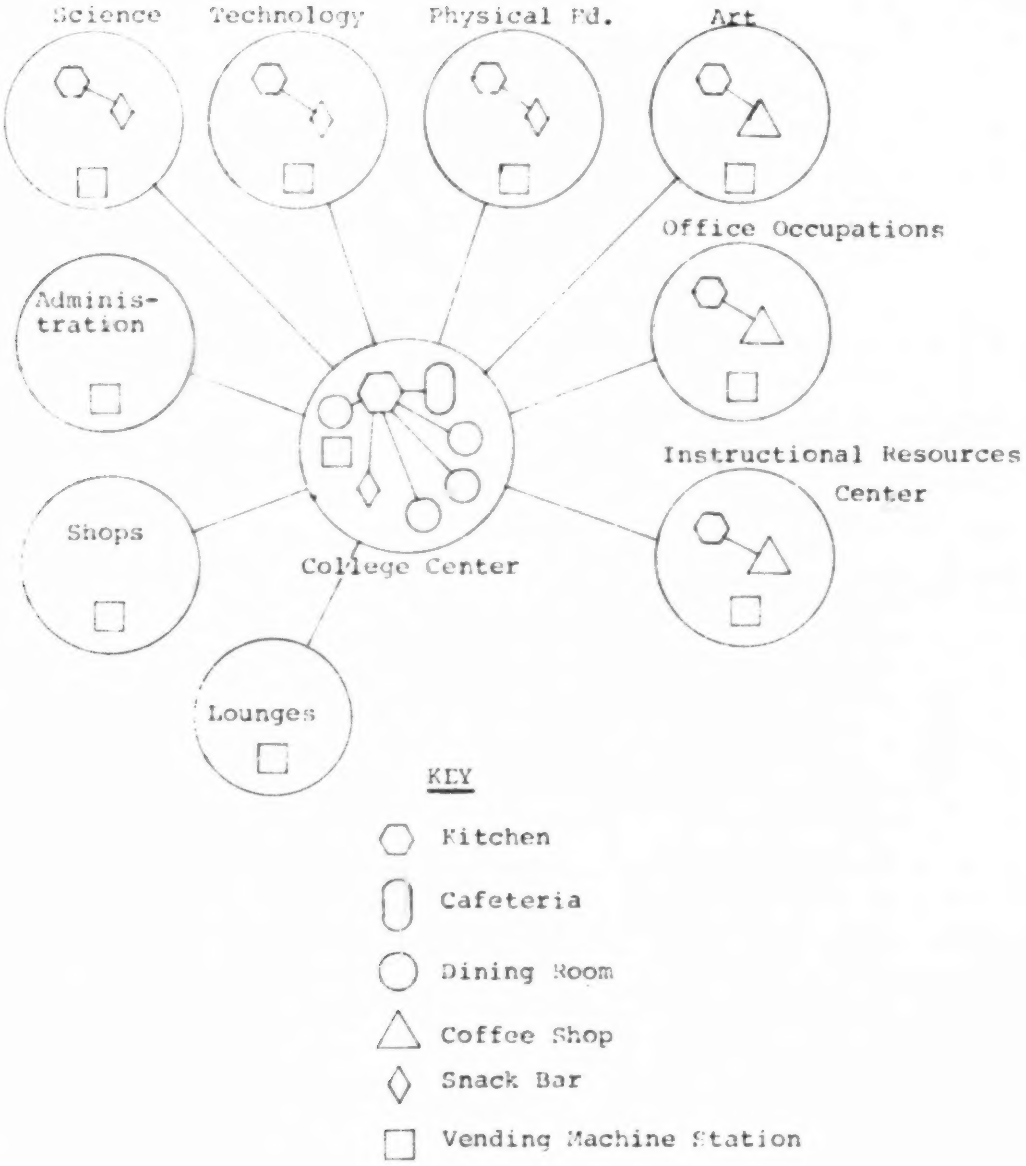

Science
Technology
Physical Ed.
Art
Office Occupations
Administration
Instructional Resources Center
Shops
College Center
Lounges
KEY
Kitchen
Cafeteria
Dining Room
Coffee Shop
Snack Bar
Vending Machine Station

Table 21.1 gives a summary of the type of food service outlets suggested for the campus along with approximate space requirements, and the following paragraphs briefly describe these spaces.

TABLE 21.1

FOOD SERVICE STATIONS SUGGESTED FOR SEATTLE COMMUNITY COLLEGE

Code	Type of Station	Possible Location[b]	Seating Capacity	Approximate Area (square feet)
A	Cafeteria	Center	350	a
B	Dining Hall	Center	100	a
C	Banquet Room[c]	Center	60	a
D	Banquet Room	Center	60	a
E	Banquet Room	Center	30	a
F	Coffee Shop	Art	40	800
G	Coffee Shop	Business	40	800
H	Coffee Shop	IRC	40	800
I	Snack Bar	Science	25	400
J	Snack Bar	Technology	25	400
K	Snack Bar	Physical Ed.	25	400
L	Vending Station	Administration	—	100
M	Vending Station	Shop	—	100
N	Vending Stations	Study Lounge	—	(100)
O	Retail Outlet	Bookstore	—	a

---

[a] See Community College Center, Chapter V.

[b] These locations are tentative suggestions only; the nature of the site plan will determine final locations. It is intended only that food service outlets be situated near points where students will tend to concentrate.

[c] To be reserved, except in unusual circumstances, as a faculty dining room. This space should provide for table service.

Cafeteria—The cafeteria, located in the student center, should provide a variety of seating arrangements. It is expected that approximately 1,500 students will use this facility for the noon meal and 500 in the evenings. A maximum of 350 students is expected at any one time during the meal serving period; a fairly rapid turnover will permit the projected total student customers to be served. A "scramble" serving arrangement is recommended. Carpeting for the floors is highly recommended, although some hard-floor surface for dancing is desirable. It is essential that the total floor area be broken into smaller units by the use of planters, special arrangements of furniture, movable screens, etc., to enhance the quality of the environment. Air conditioning is considered a necessity. The cafeteria should open to the outdoors in order to provide the possibility of outdoor dining. This outdoor area should have heating and be partially sheltered from wind and rain. The room should have a music distribution system. Light control is desirable. The exact furniture specifications should grow out of a special consultant's recommendations. (For additional comments, see the chapter on facilities requirements for the Student Center.)

Dining Hall-Banquet Rooms—Four dining areas, contiguous but separable, have been suggested. One of these is a faculty dining room. Another should be made available upon reservation to student or faculty groups wishing to hold luncheon or dinner meetings on the campus; when not so engaged, it can be available for table service or additional cafeteria seating. The other two rooms should be available for table service at every meal period. These areas should be so arranged that they can be combined for use as banquet halls of varying capacity. All four rooms should be carpeted and air conditioned and should have capabilities for light control. Except for the faculty dining room, these spaces should have RAMP capabilities.

Coffee Shops—Coffee shops are visualized as providing a basic short-order menu consisting of salads, soups, sandwiches, deserts and beverages. The satellite kitchens which will service these coffee shops will consist mainly of the equipment for processing prepared foods. However, the coffee shops should have an atmosphere conducive to informal interactions between students. The decor should say, "linger, relax, talk."

Snack Bars—Snack bars are visualized as being primarily quick-service food stations. They should provide a basic short-order menu, one more limited in scope than that of the coffee shops. They may employ paper plates and disposable utensils. They will feature stand-up dining, even though they may have a few seating spaces. The turnover rate of customers is expected to be great. Decor should be attractive and pleasant, but should not be conducive to lingering.

Vending Machine Stations—Vending machine stations should be provided in several locations on campus. These stations will not be manned, nor should they necessarily provide for more than minimal seating. Hot and cold bevarges, sandwiches, cookies and candies will constitute their major merchandise.

Kitchens—The kitchens which support these food service outlets and their menus are teaching laboratories for this college unit and will be described in detail later by a specialist kitchen consultant.

Retail Outlet—A retail sales outlet for bakery products should be assigned to this college unit and located in the college bookstore. This space should have display cases, customer areas, cash register, etc. Approximately 250 square feet should be so allocated. This should have ingress to a storage room of approximately 150 square feet; the storage room, in turn, should have egress to the outside for delivery purposes. Shelving, a work table and storage for packaging supplies should be provided here.

Implications for Administration

Because it is planned that the personnel of the Food Services area will man the various food service outlets throughout the campus, an unusual administrative organization must be devised. One scheme which provides a feasible method of coordination of the complex activities of this college unit is implied by Figure 21.2.

The Instruction Program in Food Services

Philosophy and Objectives

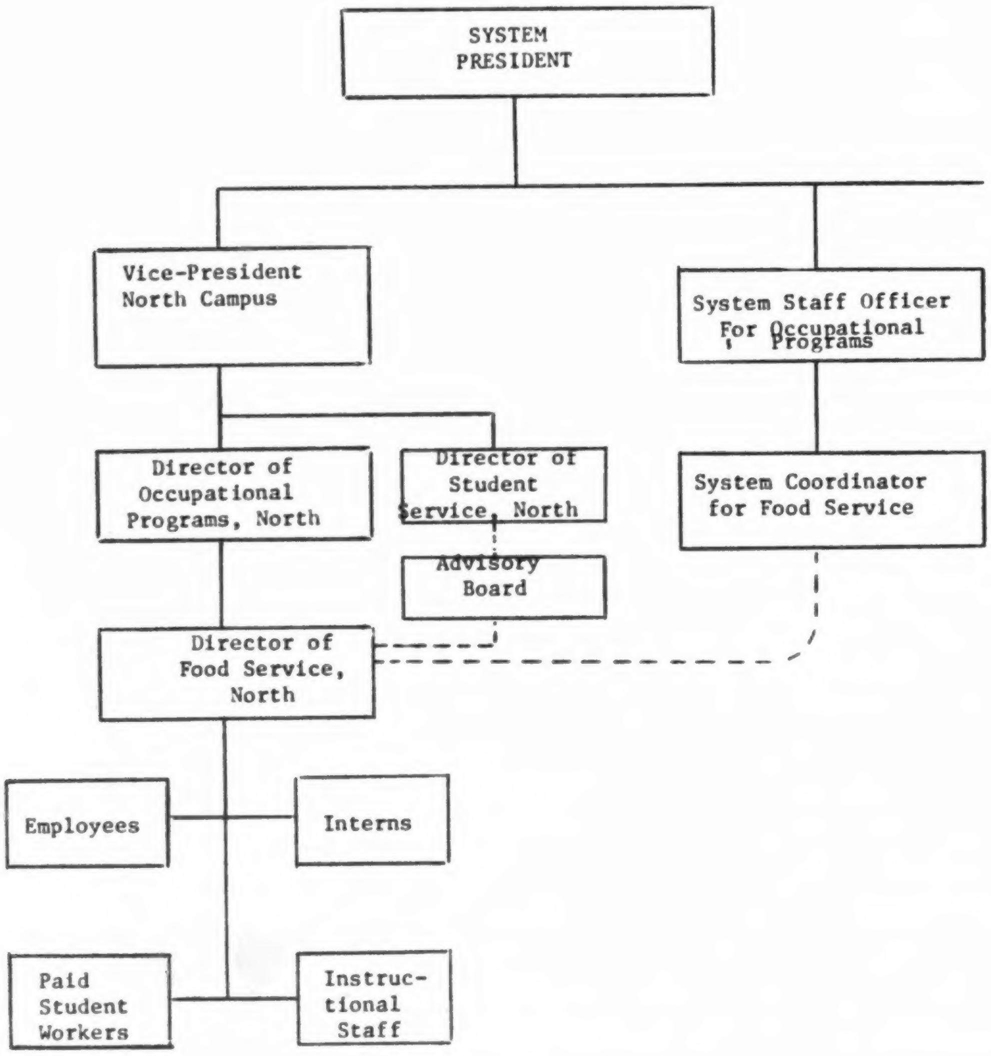
The operation of this unit will provide for three important functions of the Seattle Community College: (1) it will provide on each campus some teaching laboratories for on-going curricula in Hotel-Motel Management and Restaurant Management which are conducted centrally; (2) it will provide instructional facilities for students in programs in Restaurant Cooking, Food Service and Commercial Food Preparation; and (3) it will provide for all the kinds of food services for the college. The scope of the activities of this college unit thus encompasses both teaching functions in the relevant occupational areas and certain auxiliary enterprise functions of the institution.

Curricula and Courses: The curricula for which the campus food service outlets provide support include the following:

1. Hotel-Motel Management
2. Restaurant Management
3. Restaurant Cooking
4. Food Service
5. Commercial Food Preparation

FIGURE 21.2

AN ADMINISTRATIVE AND OPERATIONAL SCHEME WHEREBY BOTH THE INSTRUCTIONAL PROGRAM IN FOOD SERVICES AND THE PRODUCTIVE FOOD SERVICE ENTERPRISE FOR THE NORTH CAMPUS CAN BE ACCOMPLISHED.


SYSTEM PRESIDENT
Vice-President North Campus
System Staff Officer For Occupational Programs
Director of Occupational Programs, North
Director of Student Service, North
System Coordinator for Food Service
Advisory Board
Director of Food Service, North
Employees
Interns
Paid Student Workers
Instructional Staff

Courses in these curricula include the following:

1. Personal Development
2. Dining Service
3. Cooking Preparation
4. Elementary Cooking
5. Advanced Food Preparation
6. Cakes, Cookies and Pies
7. Food Service Sales
8. Introduction to Hotel-Motel Management
9. Front Office Procedures
10. Hotel-Motel Accounting
11. Food and Beverage Control
12. Innkeepers' Laws
13. Maintenance and Engineering

Curricular areas closely related to the instructional programs in Food Service Occupations include the following:

1. Communications
2. General Studies
3. Business Management
4. Physical Education

Teaching and Learning Activities

Teaching activities in the laboratory areas will include demonstration of techniques and methods, supervision of student interns, giving individual help and leading informational discussions; in classrooms, teaching activity includes lecturing, showing slides, using overhead projector, showing films, answering questions and leading discussions. Student activities in the teaching laboratories include observation of demonstrations, practice with methods and techniques and internship in production activities; in classrooms, student activities include listening to lectures, taking notes, observing demonstrations, visuals, audio-visuals, asking questions and participating in discussions.

Student Groups

Student, faculty and auxiliary staff will operate all productive food service facilities on the college campus. Students will be grouped for instructional purposes to meet the needs of the productive function; hence, no minimum or maximum group size in laboratories can be specified. It is expected, however, that 12-15 students will work together in major opperations. In classrooms, group sizes of 30 are permissible. An occasional (once per week, two hours per period) convocation of all Food Service students is expected to be called. As many as 300 students may be involved in these situations.

Table 21.2 summarizes the numbers of students and faculty members expected to be associated with the Food Service programs.

TABLE 21.2

PERSONNEL ASSOCIATED WITH FOOD SERVICE

Program	Students[a]	Faculty
Hotel-Motel Management	25	—
Restaurant Management	25	—
Restaurant Cooking	40	2
Food Service	25	1
Commercial Food Preparation	25	2
Total	140	5

---

[a] Interns only; basic college work will be taken at the central campus, with an on-going internship/work-study program at each of the college campuses.

The implications of Table 21.2 are that the following administrative spaces should be provided for this college unit:

1 Administrative Office	150 square feet
1 Reception Area	120 square feet
5 Faculty Offices @ 80 sq. ft. each	400 square feet
12 part-time faculty spaces @ 20 sq. ft.	240 square feet
1 Faculty Dressing Area	100 square feet
Total	1,010 square feet

It is assumed that the Administrative Office referred to above will be occupied by the Campus Food Service Director.

Since evening classes, adult classes and other special classes will from time to time use the facilities of this college unit, it is recommended that office spaces be provided for the part-time or *ad hoc* staff which will be associated with such programs. Twelve such spaces at approximately 20 square feet each, or a total of 240 square feet, are suggested.

Additional implications of Table 21.2 may also be noted, for they are relevant to other space needs. For example, it is projected that the student interns in each program shown in the table will use classroom facilities for one hour per day while interning on campus. Most programs will have one section of students, although two sections of Restaurant Cooking are anticipated. Hence, one classroom with a capacity for 25 students (approximately 560 square feet) is expected to satisfy the needs for classroom facilities. This classroom is slightly larger than normal because of the needs for specialized demonstration areas in the room. Table 21.3 gives the details of this analysis.

TABLE 21.3

CLASSROOM USAGE BY STUDENTS IN FOOD SERVICE AND RELATED OCCUPATIONS

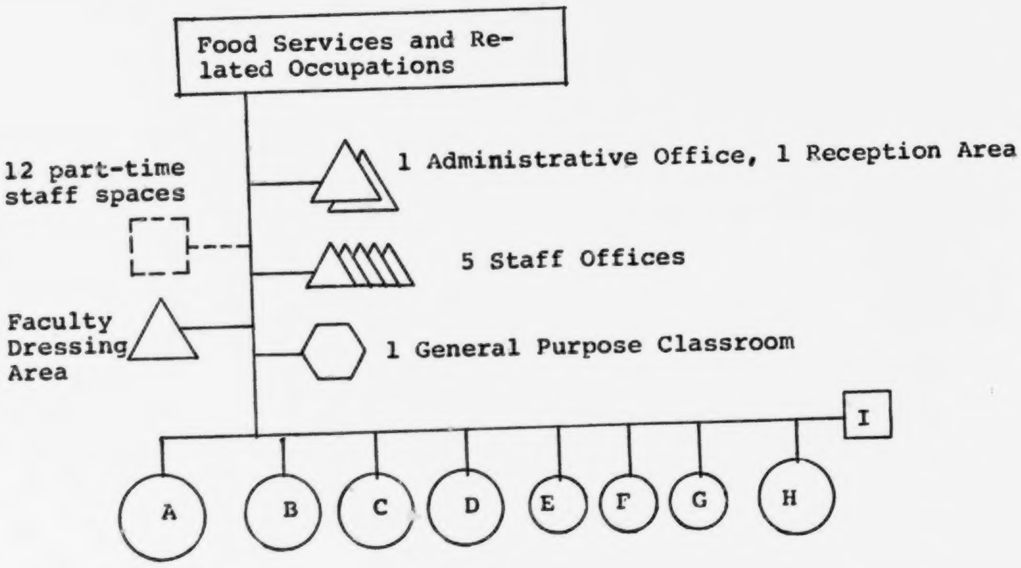
Program	Numer of Students	Sections	Total Hours Per Day in Class
Hotel-Motel Management	25	1	1
Restaurant Management	25	1	1
Restaurant Cooking	40	2	2
Food Service	25	1	1
Commercial Food Preparation	25	1	1
Total	140	6	6

Space Components of the Instructional Program

Figure 21.3 presents the spaces needed to implement the instructional program in the Food Services and Related Occupations. It will be noted that an administrative office, five staff offices, one general purpose classroom and seven kitchens have been assigned. Certain auxiliary space (storage, freezer space, etc.) is mandatory.

FIGURE 21.3

SPACES SUGGESTED TO IMPLEMENT THE INSTRUCTIONAL PROGRAM IN FOOD SERVICES AND RELATED OCCUPATIONS


Food Services and Related Occupations
12 part-time staff spaces
1 Administrative Office, 1 Reception Area
5 Staff Offices
Faculty Dressing Area
1 General Purpose Classroom
I
A
B
C
D
E
F
G
H

A. Main Kitchen
B. Coffee Shop Kitchen
C. Coffee Shop Kitchen
D. Coffee Shop Kitchen
E. Snack Bar Kitchen
F. Snack Bar Kitchen
G. Snack Bar Kitchen
H. Locker & Dressing Rooms
I. Vehicle Storage

Table 21.4 gives some comments on the specialized spaces indicated in this area. Because methods of cookery are currently changing rapidly and because certain trends involving radical departures from traditional practices can even now be perceived as emerging, detailed specifications have not been listed; rather, only broad space guidelines have been drawn, and only a few basic equipment suggestions have been made.

TABLE 21.4

COMMENTS ON SPACE CHARACTERISTICS FOR FOOD SERVICES

A. **Main Kitchen**	
Approximate Area	4,800 sq. ft.
Usage	Productive kitchen for dining halls and cafeteria; teaching laboratory for all foods preparation subjects.
Furniture and Equipment	Because of the specialized nature of the equipment in this space, specifications from a kitchen consultant are required. These will be supplied subsequently.
Remarks	Delivery access, access to each food service outlet.
B., C., D. **Coffee Shop Kitchen**	
Approximate Area	800 sq. ft.
Usage	Satellite kitchen serving coffee shop.
Furniture and Equipment	Because of the specialized nature of the equipment in this space, specifications from a kitchen consultant are required. These will be supplied subsequently.
Remarks	Access to delivery.
E., F., G., **Snack Bar Kitchen**	
Approximate Area	450 sq. ft.
Usage	Satellite kitchens serving snack bars.
Furniture and Equipment	Because of the specialized nature of the equipment in this space, specifications from a kitchen consultant are required. These will be supplied subsequently.
Remarks	Access to delivery.

H. Locker and Dressing Rooms

Approximate Area	600 sq. ft.
Usage	Space for changing and storing clothing; two spaces, men and women.
Remarks	Contains shower, wash, toilet, locker facilities.

I. Vehicle Storage

Remarks	Vehicles for use by food service units on campus must be parked. Ramps for loading and unloading are to be provided.

Classroom—This classroom should contain 25 student stations, chalkboard, corkboard and provision for RAMP services. In addition, it should contain a demonstration table with an overhead mirror. A sink should be provided on a side wall near the instructor's station. Extra space around the demonstration table should be provided so that student "stand-up" viewing of demonstrations is possible.

Spaces Infrequently Used by Students in Food Service and Related Occupations

In addition to the specialized spaces previously listed, students will occasionally use additional spaces as indicated in Table 21.5.

TABLE 21.5

SPACES REQUIRED FOR OCCASIONAL USE BY STUDENTS IN FOOD SERVICE AND RELATED OCCUPATIONS

Type of Space	No. of Stations	Approximate Usage[a]
Communications Classroom	25	2 hours/day
Accounting Laboratory	25	½ hour/day
Social Studies Classroom	25	1 hour/day
Lecture Theater	300	1 period/month
Confrontorium	25	½ hour/day

[a] It must be remembered that students in these programs are *interns only* and are housed on this campus only while interning. Usage data has been averaged over the academic year; hence, the averaged data shows fractions. Peak usage may be greater than indicated in the table.

Summary of Space Recommendations

Table 21.6 gives a summary of all the space needs associated with this college unit. Cross-references are given in the "Code" column.

TABLE 21.6

SUMMARY OF SPACE NEEDS FOR THE FOOD SERVICE PROGRAM

Type of Space	Code	Number of Units	Student Stations Per Unit	Total Student Stations	Approx. Area Per (sq. ft.)	Approx. Total Area (sq. ft.)
Cafeteria	Table 21.1-A	1	(350)	(350)		a
Dining Hall	Table 21.1-B	1	(100)	(100)		a
Banquet Rooms	Table 21.1-C, D	2	(60)	(120)		a
Banquet Room	Table 21.1-E	1	(30)	(30)		a
Coffee Shop	Table 21.1-F, G, H	3	(40)	(120)	(800)	2,400
Snack Bar	Table 21.1-I, J, K	1		(100)		a
Vending Stations	Table 21.1-L, M, N	3+	——	——	100	300
Main Kitchen	Figure 21.3-A	1	20	20	4,800	4,800
Coffee Shop Kitchens	Figure 21.3-B, C, D	3	3	9	800	2,400
Snack Bar Kitchens	Figure 21.3-E, F, G	3	2	6	450	1,350
Retail Outlet	Table 21.1-O	1	3	3		a
Student Locker Rooms	Figure 21.3-H	2	——	——	300	600
Admin. Office	Table 21.2-ff	1	——	——	150	150
Reception Area	Table 21.2-ff	1	——	——	120	120
Faculty Offices	Table 21.2-ff	5	——	——	80	400
Faculty Dressing Area	Table 21.2-ff	1	——	——	100	100
Part-time Staff Offices	Figure 21.3	12	——	——	20	240

TABLE 21.6 (Cont'd)

SUMMARY OF SPACE NEEDS FOR THE FOOD SERVICE PROGRAM

Type of Space	Code	Number of Units	Student Stations Per Unit	Total Student Stations	Approx. Area Per (sq. ft.)	Approx. Total Area (sq. ft.)
Classroom	Table 21.3	1	25	25	560	560
Communications Lab.	Table 21.5	—	——	25	———	b
Accounting Lab.	Table 21.5	—	——	25	———	c
Soc. Studies Classroom	Table 21.5	—	——	25	———	d
Multi-Media Theater	Table 21.5	—	——	300	———	e
Confrontorium	Table 21.5	—	——	25	———	f
Total						13,420[g]

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[a] See also Chapter V.
[b] See also Chapter XII.
[c] See also Chapter XVII.
[d] See also Chapter XXII.
[e] See also Chapters VI, XI.
[f] See also Chapter XVII.
[g] This total is exclusive of food service outlets; the area of food service stations is replicated in Chapter V, "The College Community Center." The program of food service outlets here, however, is to be regarded as more definitive than that in Chapter V. The area shown as a total in this table is that assignable to the productive kitchens and the instructional program.

XXII

FACILITIES FOR THE SOCIAL SCIENCES

Philosophy and Objectives

The social sciences program will serve students in all of the programs offered by the College. Courses in this area will be required of students pursuing both college parallel and occupational programs of the College. Social sciences courses will often be required of adults enrolled in the high school diploma program and for individual improvement as well.

The basic purpose of the social sciences program will be to provide students with a background on past and contemporary historical, social, political and economic developments and issues. Through the courses offered, students are expected to attain understanding and appreciations that will make them informed and critical of the world and time in which they live. Further, it is expected that the experiences in these courses will result in their becoming committed to improving this Nation and the world generally.

In addition to the above stated purposes, the program will serve limited but important needs of special programs. Students enrolled in pre-professional and social science oriented curricula will need to take specialized introductory courses during their first two years of college. Certain occupational programs such as law enforcement will also draw upon this area for allied supporting courses.

Course Description

Courses will be offered in all academic disciplines which broadly interpreted comprise the social sciences. By way of summary, the course offerings which need to be provided by these facilities consist of the following:

1. Anthropology
2. Economics
3. Education
4. Geography
5. Philosophy
6. Philology
7. Political Science
8. Psychology
9. Sociology
10. Integrated Social Science

Teaching and Learning Activities

Teaching activities in the social sciences will focus around methods of developing understanding and how to analyze and apply social concepts.

As a background for accomplishing these ends, it is necessary for students to develop factual background and skills. For example, they will need to develop skills in map interpretations, ability to interpret quantitative data and social science research techniques.

Accomplishing the objectives of the social sciences program will require a variety of activities by social science instructors. There will be need for formally organized presentations whether by a lecturer in the classroom or from a television studio. However, these lectures must be combined with opportunities for students to test newly acquired ideas and skills. This calls for written work where concepts can be developed and analyzed, and discussions where ideas can be tested against those of others. In addition, laboratory sessions are needed where students have an opportunity to work on developing social science skills.

Instructors of each course are expected to work closely together. It is anticipated that they will share the formal lectures of a course drawing upon the strengths of their individual backgrounds.

Some Emerging Concepts

Recent and emerging developments in educational technology have important considerations for planning the social sciences instructional facilities. The implications of these developments for classroom procedures and the grouping of students are of particular significance.

Developments are occurring which also have an impact on the social sciences curriculum. One of these is the increasing prominence of the Eastern Hemisphere, especially the Orient, upon world affairs. Another is a strong trend in the social sciences toward quantitative analysis. This especially is true in economics, psychology and sociology.

These developments in technology and curriculum orientation have significance for planning the space in which social science instruction will be carried on. Every effort should be made to plan facilities which will enable instructors to devise and manipulate learning situations, present appropriate material and use instructional media which will result in maximum student learning. A dilemma is presented, however, in that it is too early to accurately assess the potential of some recently introduced innovations. It is even more difficult to anticipate developments that may be just around the corner. Nevertheless, it appears a virtual certainty that the next quarter of a century will be a period of instructional innovation in junior colleges. Funds are being made available to develop and to test new instructional devices and teaching procedures.

Coupled with this force is the pressure in increased enrollments. Junior college administrators and faculty members in growing numbers recognize that they must find ways of serving more students. They are seeking to accomplish this without doing violence to accepted principles of learning and achievement. Some developing trends that offer promise are as follows:

1. Variable patterns of student grouping for instruction utilizing large groups, small groups and individualized study within a single course. Learning which requires frequent interchange of ideas between students and an instructor is carried on in small groups. Factual information and organized background material is presented to students on an individual basis or in large groups utilizing the lecture, television, film and new technical aids.
2. Greater dependence placed upon students to assume responsibility for learning on an individualized basis.
3. Use of programmed materials by means of programmed texts, teaching machines and computers.
4. Access to instructional materials by information retrieval systems centrally controlled on a campus or group of campuses.

Classroom dimensions and shapes as well as structural, utility and service systems must permit ready adaptation if these new developments are to be possible when they become operationally perfected and educationally validated.

Student Groups

Table 22.1 presents an analysis of the anticipated social sciences FTE enrollment in terms of the proportion of students drawn from the various types of programs offered by the College. It is calculated that the contact hours per hour of enrollment will total 618 FTE students. The majority of this enrollment will be from students enrolled in the Associate of Arts transfer program. However, as noted in the introduction to this chapter, students will be drawn from all programs offered by the College.

For reasons already indicated, class sizes are expected to range widely. The large lecture sections should range between 100 and 200 in size while the seminar discussion groups should be 15 to 20. In addition, there will be immediate need for typical size class groups of 30 to 40 students.

Reference has been made to the fact that in the years ahead substantial changes can be expected in grouping arrangements. The time is probably not too distant when most courses that draw large enrollments will operate on a variable size arrangement. Portions of such courses will be presented to large groups of students—100 or more—and other portions will be presented to students in groups of 16 to 20.

Since students from all programs will enroll in social sciences courses, they will represent widely diverse backgrounds, abilities and motivations. There will be a sizeable group who are comparable to the freshmen and sophomore students in the best senior colleges. At the other extreme will be students of only average academic ability and with poor backgrounds.

TABLE 22.1

COMPUTATION OF FTE ENROLLMENT BY SOCIAL SCIENCES PROGRAM[1]

Type Program	Percent of Program Taken in Social Sci.	Total Contact Hours Per Week	Contact Hours per Day	Contact Hours per Hour
Associate Arts	25%	10,100	2,020	404
Associate of Applied Science	12%	2,006[2]	401	80
Pre-College	20%	640	128	26
Certificate and Diploma	15%	2,232[2]	446	89
Community Service	10%	480	96	19
Total		15,458	3,091	618

---

[1] Room and student station utilization have been computed on a basis equal to the following: 85% room period utilization, 80% student station period utilization, eight period day, and a 5 day week.

[2] Based on twenty (20) contact hours per student per week. Twelve (12) per cent are spent in social science courses.

In summary, an important consideration in planning facilities for the social sciences program is variability. There will be variation in (1) student ability, age, background and motivation; (2) faculty orientation, capabilities and background; (3) course content and its rate and nature of change and (4) the stage of technological development of instructional aids. The implication of these factors in planning is quite obvious. Variation is needed in the facilities and equipment form the onset.

Faculty and Staff

A social sciences faculty of 25 is projected as needed. This figure is arrived at by using an FTE student-faculty ratio of 25:1. Dividing the anticipated social sciences FTE student enrollment of 618 by 25 gives a faculty requirement of 25. In addition, it is estimated that there will be a part-time faculty of between 5 and 10. Secretarial requirements are projected at a ratio of one for each seven faculty members.

By way of summary, office and work space will need to be provided for the following social science faculty and secretarial staff:

Department head	1
Full-time faculty	25
Part-time faculty	5
Secretaries	4

Table 22.2 shows the space requirements for these offices and work areas. The total space needed for these purposes is estimated to be 3,270 square feet.

Furnishings and Major Equipment

The furniture for the social science instructional areas should be of a type that permits maximum adaptability and hopefully will be usable when the anticipated technological developments call for modifications in the present instructional areas.

TABLE 22.2

SPACE NEEDS FOR THE SOCIAL SCIENCES FACULTY AND SECRETARIAL STAFF

Types of Spaces	Number of Units	Area per Unit (sq. ft.)	Total Space Needs (sq. ft.)
Administrative Office	1	150	150
Reception Area	1	120	120
Secretarial Offices	3	100	300
Faculty Offices (Full-time)	25	80	2,000
*Part-Time Faculty Offices	5	40	200
**Faculty Lounge	1	500	500
Total	36		3,270

---

*It is anticipated that two part-time faculty members will share an office.

**It is recommended that this lounge area be combined with the lounge area for other faculty groups rather than be separate for the social sciences faculty.

Seminar Rooms

Seven social sciences seminar rooms are recommended. Each one should accommodate 20 students. These rooms will be used for small group instruction. The activities carried on in them will include discussions, demonstrations, viewing visual material—both non-projected and projected, listening to tapes and recordings and carrying on amplified telephonic conversations.

The design and colors of these spaces should be such as to create an atmosphere of informality and reflect the vitality and excitement of the social sciences. Consideration should be given to having limited windows for these spaces. Rooms might be designed and decorated to depict the various social sciences.

These rooms should *each* be furnished and equipped as follows:

1. Tables and chairs for 20 students.
2. Pull-down projection screen.
3. Carpet as acoustical treatment and floor covering.
4. Movable coat/umbrella storage rack.
5. Eight linear feet of chalkboard.
6. Map rails and hangers above the chalkboard.
7. Six linear feet of bulletin board space.
8. Six linear feet of map and book closet space.
9. Audio-visual equipment stand mounted on wheels.

General-Purpose Classrooms

Seven such rooms are needed for social science classes. These rooms will be used alternately for such student activities as listening to lectures, note taking, listening to tapes and recordings, viewing both projected and non-projected materials, viewing educational television and participating in group discussion.

It has been noted that rooms are likely to become obsolete in size, and a change in space organization may be required at some future date. Therefore, they should be designed so as to permit combining them at some future time.

Furnishings and equipment for each of these rooms should consist of:

1. Individual tables and chairs for 35.
2. Pull-down projection screen.
3. Twelve linear feet of chalkboard.

4. Six linear feet of bulletin board space.
5. Map rails and hangers above chalkboard.
6. Movable coat/umbrella storage rack.
7. Movable bookcase and storage cabinet (not built-in).
8. Instructor's desk and chair.
9. Audio-visual stand mounted on wheels.

Carpeting as acoustical treatment and floor covering should be considered. Color should be used to create variety among these classrooms. As with the seminar rooms, an effort should be made in decorating to give them a social sciences "look."

Large Lecture Room

One of these rooms is recommended. It will serve essentially the same type of student activity as the regular classrooms and will require fixed upholstered seats with fold down tablet arm equipment. Seating is needed for 120 students in the large lecture room. RAMP facilities and rear projection screen equipment should be provided. Care must be taken in the design to allow proper sight lines.

Faculty and Staff Offices

Each full-time faculty office should be furnished as follows:

1. Office desk
2. Cushioned chair
3. File cabinet
4. Map and chart storage cabinet
5. One wall of wall-hung shelving
6. Coat cabinet
7. Telephone

Each secretary should be provided with the following:

1. Secretarial desk
2. Work table
3. Secretarial chair
4. Two file cabinets
5. Coat cabinet

Part-time faculty offices should each be furnished as follows:

1. 30 by 42 inch table

2. Upholstered chair
3. File cabinet
4. Coat rack
5. Shelving for books

Work Room

This room should contain a work counter with sink and cupboard space, space for work tables and open shelving for storage. This room should be located in the classroom area and near the faculty office area.

Environmental and Utilities Requirements

All social sciences instructional spaces should meet the following environmental and utilities requirements:

1. Ventilation adequate for comfort with windows closed.
2. Good lighting.
3. Sound and light control to permit use of audio-visual aids.
4. Individual room controls for heating and ventilation.
5. Electrical outlets spaced 10 feet apart, located around the room on the wall.
6. Equipped to use the following:
    a. RAMP media.
    b. Closed circuit and broadcast television.
    c. Built-in speaker and connections for direct telephone hook-up.
7. Handwashing facilities.

Recommended Space Guidelines

Reference is made in the section on furniture and equipment to the types and number of spaces needed primarily for the social sciences program. In addition, substantial use will be made of large group facilities being planned for general college use. Specifically, the social sciences program will be a major user of the multi-media theater being planned in the Instructional Resources Center and of the teaching auditoriums included in the edspecs of other planning committees.

Table 22.3 contains a composite of the instructional space needs for the social science program. By way of summary, the requirements are as follows:

	Student Stations
7 seminar rooms (capacity 16 each)	112
7 general purpose classrooms (capacity 35 each)	245
1 large lecture room (capacity 120 each)	120
Sub-Total	477
Multi-media theater and teaching auditoriums	141
Total	618

It is recommended that the above listed social science classrooms be designed in terms of audio and visual controls between spaces rather than as conventional classrooms This would provide maximum opportunity for subsequent modification.

Description and Diagram of Functional Relationships

Figure 22.1 shows the relationships that the social sciences facilities should have to other facilities of the College. Priority should be given to locating the social sciences instructional facilities near the Instructional Resources Center. Students in this program will among the heaviest users of that facility. Further, these instructional facilities should be in close proximity to the humanities facilities.

Offices for the social sciences faculty should be reasonably well grouped. It is strongly recommended that the seminar rooms be located so that they adjoin faculty offices. An ideal arrangement would be for each faculty member's office to be combined with a seminar room. This is not practicable. However, it is suggested that three faculty offices open onto each seminar room (the room should also open into a hallway). This arrangement will have the advantage of giving instructors direct access to materials in their offices while increasing utilization. When seminars are not in progress, these rooms can be used for faculty planning sessions and work rooms.

TABLE 22.3
SUMMARY OF SPACE GUIDELINES FOR THE SOCIAL SCIENCES PROGRAM

Types of Space	No. of Units	Area per Unit (sq. ft.)	Student Capacity per Unit	Total Capacity	Ttl. Space Needs (sq. ft.)	Hrs. per day needed for this program
I. Instructional						
A. Special Facilities						
1. Multi-media theater (Space included in Chapter VI, "Facilities for the Instructional Resources Center")						2
B. Non-specialized Facilities						
1. Seminar rooms	7	400	16	112	2,800	5
2. Regular classrooms	7	720	35	245	5,040	6
3. Large classrooms	1	1,600	120	120	1,600	6
4. Auditorium (Space included in Chapters V and XVI)						3
5. Fac. & Staff ofcs.	36				3,270	
Sub-Total	51			477	12,710	
II. Auxiliary Space						
A. Work Room	1	400			400	
B. Storage Room	1	200			200	
Total	53			477[a]	13,310	

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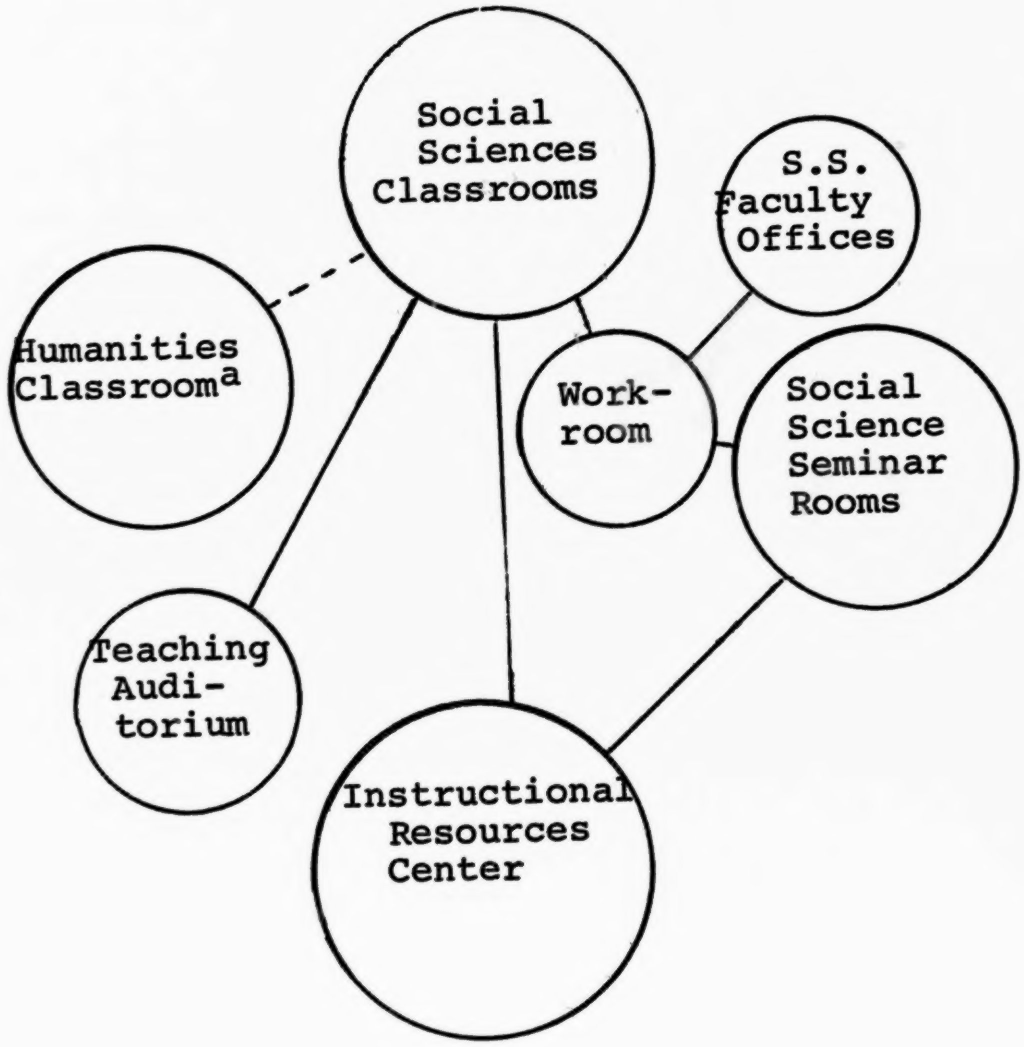
[a] Remaining anticipated enrollment (social sciences) will be accommodated in space provided by the multi-media theatre and teaching auditorium space being recommended in other chapters.

FIGURE 22.1

RELATIONSHIP OF SOCIAL SCIENCES FACILITIES TO OTHER CAMPUS FACILITIES


Social Sciences Classrooms
S.S. Faculty Offices
Humanities Classroom[a]
Work-room
Social Science Seminar Rooms
Teaching Audi-torium
Instructional Resources Center

[a] Music, art, drama, and literature.

XXIII

FACILITIES FOR THE COLLEGE DEVELOPMENTAL PROGRAM

Philosophy and Objectives

The community college developmental program is designed for that sizable proportion of students whose chances for success in any college program are minimal. In most cases, it is not sufficient merely to offer courses to remove deficiences. The program is much more fundamental in that it must aim at necessary changes in attitude, in self reassessment and a voluntary increase in motivation level.

For these reasons the developmental program must have a close relationship to the student services program, especially testing, guidance and occupational information. This gives meaning and purpose to the removal of deficiencies. Remedial courses are a necessary part of the developmental program; however, such courses alone do not cause a student to mature—to realize his rights and responsibilities as an adult, to overcome barriers which interfere with his further growth and to take responsibilities for his actions.

In brief, the developmental program is a student conservation program which is fundamental to any community college that professes to serve all levels of student interests and capacities.

The Program

The Developmental Program consists of six parts, each of which is described briefly below:

1. Students are selected for this program on the basis of an evaluation of former school work, placement test scores and the recommendation of high school and college counselors. In addition, college faculty members may recommend marginal students for entry into this program.
2. Expert and intensive counseling is an integral part of the developmental program. The student is encouraged in self assessment.
3. Occupational information is made available and the student is encouraged to read, especially those areas where his plans and ambitions suggest and in related fields requiring somewhat less rigorous study.

4. Students are encouraged to review goals in terms of factual data. In the process, the student should be aided in seeing his own weaknesses.
5. Students are assisted in the selection of developmental or remedial courses to remove deficiences.
6. Students are reassigned to credit courses upon satisfactorily completing the first five steps above.

Certain aspects of the curriculum will be conducted on an individual student basis; however, when possible, students should be served in groups.

The Curriculum

It is anticipated that the following courses will be included in the developmental program:

1. Listening Techniques. Discriminative listening to informative materials; critical listening to persuasive material. Practice exercises and tests, outside assignments in listening situations, classroom lectures.
2. Speech Clinic. Correction of speech problems such as poor vocal quality (nasality, breathiness, harshness), articulation faults (substitutions, omissions) or stuttering.
3. Reading Techniques, Reading skills, vocabulary and study techniques. Tachistoscope, individual reading accelerators, controlled reader and various reading films utilized to improve speed, comprehension and concentration. Practice reading, vocabulary study and reading of books to develop techniques of speed and comprehension of reading.
4. English Essentials. Writing of paragraphs, outlines, summaries and essays; general review of mechanics; reading intelligently for ideas.
5. Grammar. Intensive review of English grammar. Drill on parts of speech, case agreement, sentence building and punctuation.
6. Spelling Clinic. For students having special difficulty with spelling. Primary consideration to needs and aptitudes.
7. Arithmetic. Modern concepts and skills in arithmetic. Preparation for college algebra.
8. Introductory Algebra. Algebra for the first time or for those who require a refresher.
9. Plane Geometry. Plane geometry for the first time or for those who require a refresher.

10. Science. A refresher course in general science, with emphasis on scientific procedure and principles.
11. Occupational Choices. An introduction to the world of work, unskilled and skilled trades, operators, salesmen, technicians, professions with understanding of what a job sheet contains and levels of competency.
12. Planning My Future. How to match competencies with occupational requirements.
13. Student Orientation. Orientation to college and community. Information regarding special opportunities and services. Curricular planning for succeeding semesters.

These courses are typical of what will be included. It would seem advisable to require Numbers 11 and 12 and such others as seemed most necessary. Each of these courses would be designed for a quarter or semester in length and would carry no credit. Some would be prerequisites for enrollment in a college credit course.

Teaching and Learning Activities

Instructor Activities

Instructor activities will include the presentation of factual materials, answering questions, leading discussions, demonstrating devices and instruments, demonstrating problem solving techniques, using visuals and audiovisuals, supervising student performance in speech and reading lab, preparing instructional materials, use of programmed materials, supervised study, giving extensive individual counseling and instruction and overseeing the use of sophisticated equipment. There will be little large group activity.

Student Activities

In general, student activities will include listening to presentations, taking notes, participating in discussions, observing demonstrations, visuals and audio-visuals, using speech clinic equipment as well as audio-listening equipment and reading improvement devices. The seminar, the auto tutorial lab, supervised study and small group activity will be used extensively. Individual student participation will be emphasized.

Student Characteristics

This program will enroll many students either who have experienced marginal success in terms of their educational goals or who have failed to take advantage of their past educational opportunities. Especially trained and experienced teachers are required to motivate such individuals and to help them achieve success. This calls for variety in instructional method, including the use of all types of audio and visual aids, demonstrations, explanations, practice and the frequent feed-back on progress. It should also be noted that motivation to some of those who enroll is transitory, and for these students, "dropout" is a continuing threat.

Student Groups

Number of Students, Estimates of Clock Hours Usage of Facilities

Data collected for the college, based upon its experience and upon the experiences of other colleges providing developmental programs, suggest for this college unit the student population shown in Table 23.1. The instructional staff required by such an enrollment is also shown in the table.

The estimated facilities for an estimated enrollment of 900 is based upon the assumption that approximately one-half of the activities will take place in laboratories, and the remaining one-half will take place in general classrooms. In other words, 4,725 contact hours will be in laboratories and 4,725 in general classrooms.

TABLE 23.1

Enrollment		Contact Hours	Total Contact Hours	Faculty Needed
Full time	450	18	8,100	25
Part-time	450	3	1,350	4
Totals	900		9,450	29

Based upon a laboratory room utilization of 60 per cent, a student station utilization of 85 per cent and an effective eight hour day (40 hours per week), a total of approximately 240 lab stations will be required.

Based upon a general classroom utilization of 80 per cent, a student station utilization of 85 per cent and an effective eight hour day (40 hour week), a total of approximately 175 general classroom student stations will be required.

Class Sizes

Class sizes for most aspects of this program should be kept small. This is necessary for the individual assistance that is needed, for the learning activities and to afford those enrolled a measure of security and identity. This calls for classes which range in size from 10 to 25.

General classroom space has already been planned for these students in other sections of this report. However, attention will need to be given to the 240 laboratory stations and the special carrels essential to this program. The laboratory stations are needed in specialized laboratories for reading, writing, listening and communications. Six laboratories containing 25 student stations each will be needed.

Individual student carrels are needed also. Assuming that each full-time student in the program would use a carrel for one hour twice a week and each part-time student for one hour once a week would mean a total of 1,350 hours. To accommodate this number would require three rooms or spaces of 25 carrels each (25 square feet per carrel).

It is anticipated that twenty instructors, one program director and a secretary will be required to support the proposed daytime program.

In addition, nine instructors will be required to support the evening program. This creates a need for one director's office, a secretary's office, twenty instructors' offices and nine evening instructors' spaces. These facilities are included in Table 23.2.

Reading-Writing Laboratory (3 each)

These rooms should contain approximately 900 square feet and should accommodate 25 students at tables arranged for seminar-type use. Cupboard storage should be provided for large tachistoscopes and controlled reading devices. Open book shelving should also be provided. Approximately 16 linear feet of chalkboard with map rail and hooks and a pull-down A-V screen are needed. Approximately 12 linear feet of tackboard are also needed. Light control should be provided for dim-out conditions. A small storage space of approximately 100 square feet should be planned as a part of this facility. At least ten reading carrels should be provided.

Communications Laboratory (3 each)

These rooms should provide individual listening and recording carrels for 25 students. Each should contain approximately 800 square feet of space. A raised platform should be provided at the front of the room to allow the instructor full view of the students. A master console should be

TABLE 23.2

SPACES REQUIRED FOR THE DEVELOPMENTAL PROGRAM

Type of Space	Units	Area Per Unit	Stu. Capacity Per Unit	Total Capacity	Ttl. Area Sq. ft.	Anticipated Hrs. Daily Usage, This Department
Reading-Writing Labs	3	900	25	75	2,700	8
Communications Labs	3	800	25	75	2,400	8
General Classrooms	9	450	25	225	(a)	
Individual Study Labs	3	750	25	75	2,250	
Counseling Rooms	6	100	—	——	600	
Program Director's Office	1	150	—	——	150	
Secretary's Office	1	120	—	——	120	
Day Faculty Offices	15	90	—	——	1,350	(b)
Evening Faculty Spaces	9	20	—	——	180	
Total	50				9,750	

---

[a] Space included elsewhere.

[b] This assumes that five faculty members have offices elsewhere; for example, English, math, science, speech.

provided with several channels for instructor-student communication. Listen-record capability should be provided. A chalkboard, approximately 16 feet in length, should be installed at the proper height on the wall behind the console so that it can be seen by each student in the laboratory. A master electric switch should be provided to control the electrical output to the console and to the student carrels. A pull-down A-V screen should be installed for projecting visual aids and should be easily viewed by seated students. Adequate shelving should be provided for students to temporarily shelve books and materials not needed for use in the lab. Light control should provide for dim-out conditions. A small storage room adjoining the lab is needed for storing tapes, small items of equipment and instructional aids and materials.

Individual Study Lab (3 each)

Facilities are needed to provide opportunities for the students to work on an individualized study basis. These rooms should be equipped with 25 individual study carrels. Each lab should contain approximately 750 square feet of floor space. Some carrels should be equipped for reading, listening, viewing film clips, etc. Electrical power provisions should be made for each carrel. While this space is not projected for organized, scheduled classes, it is suggested that a standard instructor's table and chair be provided for in this space. This will allow for supervised individual study. Additional supervised study will be provided in the general classrooms.

Counseling Area (6 each)

These areas should contain approximately 100 square feet of floor space each. A counseling desk and chair will be required, as well as two student chairs. Book shelving should be provided, as well as a storage closet and files.

Equipment Summary

Communications Laboratories (3)

The equipment requirements for each lab include:

1. A rostrum—electrified—master console
2. Tape recorders and amplifiers
3. Video tapes and production. RAMP central may assist
4. Record players
5. T.V. camera and monitor
6. Audiometric testing equipment
7. Tablet armchairs, 25 per room
8. 12 linear feet of chalkboard
9. 8 linear feet of corkboard
10. Projection screen
11. T.V. reception
12. Room darkening potential
13. Shelving for books and materials

Reading-Writing Laboratories (3)

1. Tables and chairs for 25 students in each
2. Tachistoscopes and controlled reading devices
3. Sixteen linear feet of chalkboard
4. Map rail hooks and pull-down A.V. screen
5. 12 linear feet of tackboard

6. Instructor's desk and chair
7. Overhead projector
8. 10 reading carrels

Space Relationship

Figure 23.1 is a representation of the space relationships of the various components of the facilities for the developmental program. Figure 23.2 shows the relationship of the facilities for the developmental program and other campus facilities.

FIGURE 23.1
SPACE RELATIONSHIP DIAGRAM OF DEVELOPMENTAL PROGRAM FACILITIES

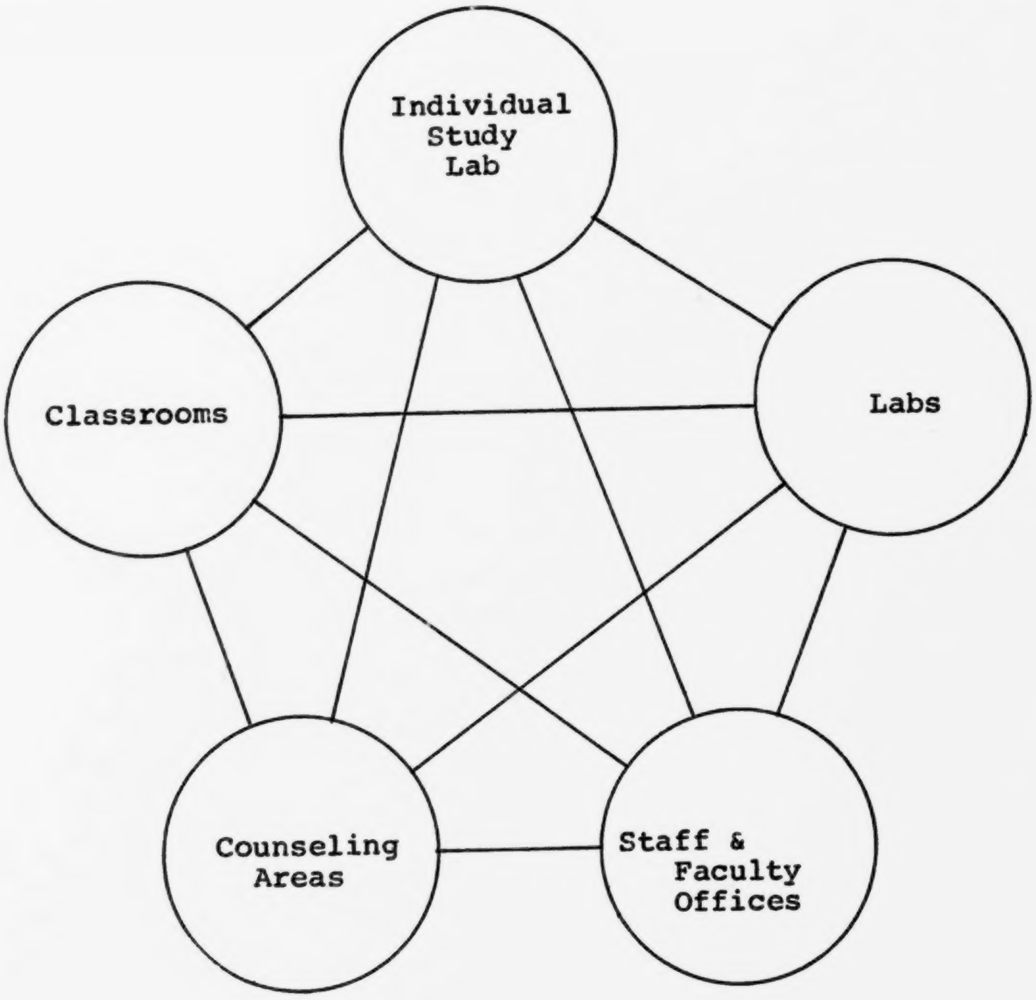
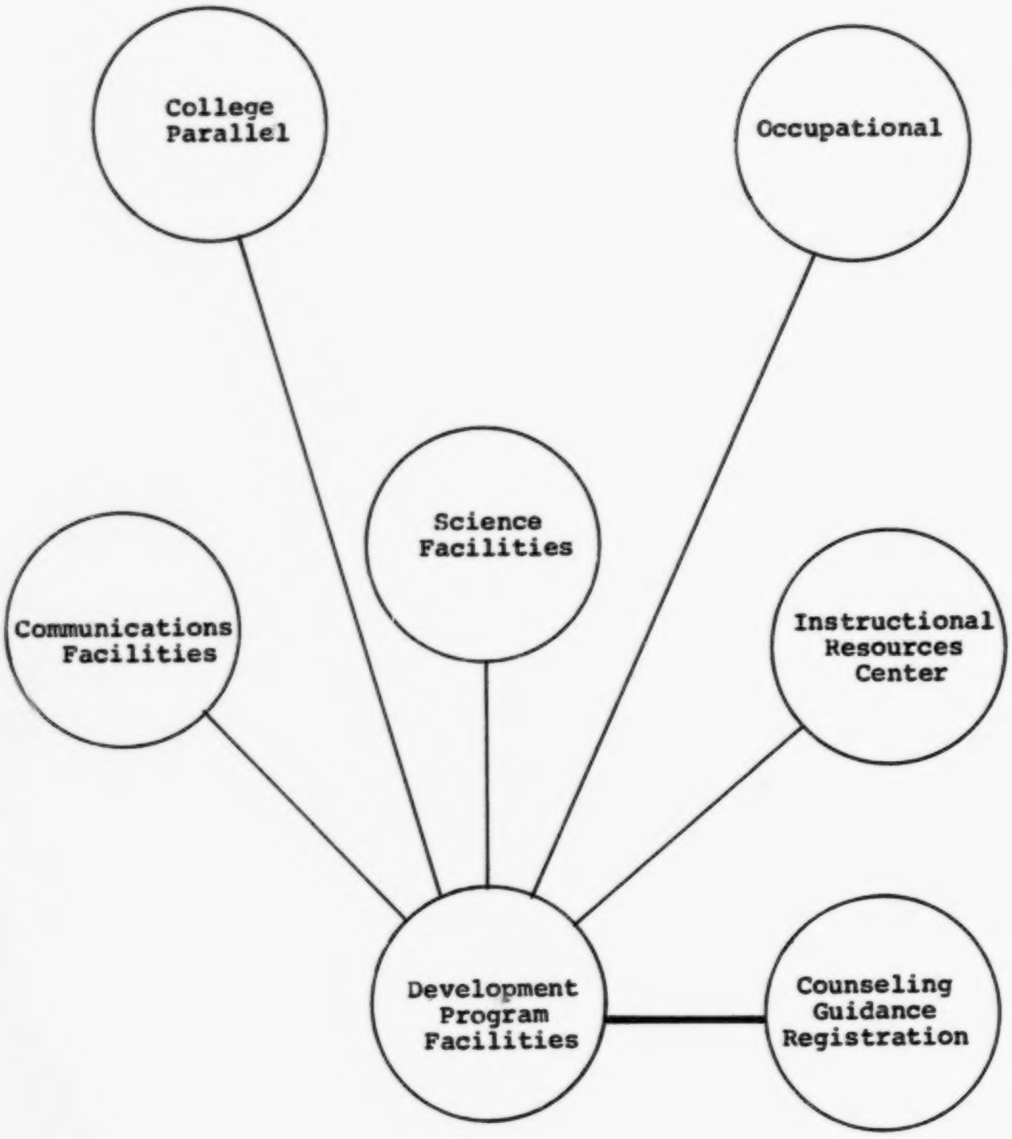

Individual Study Lab
Classrooms
Labs
Counseling Areas
Staff & Faculty Offices

FIGURE 23.2

RELATIONSHIP OF DEVELOPMENTAL PROGRAMS FACILITIES WITH OTHER CAMPUS FACILITIES


College Parallel
Occupational
Science Facilities
Communications Facilities
Instructional Resources Center
Development Program Facilities
Counseling Guidance Registration

XXIV

FACILITIES FOR PUBLIC SERVICE CURRICULA

Philosophy and Objectives

Several public service curricula are being considered for Seattle Community College. These instructional areas, although only semi-related, are envisioned as using similar facilities. Current technology programs being considered are fire protection, law enforcement, custodial engineering, environmental health, natural resources conservation and sanitation engineering. Present planning provides for implementation of these areas of instruction on an "extension" basis. Normally, classes for employed persons are operated during the evening hours, however, these public service type programs lend themselves to both daytime and evening instruction because of the varied working conditions encountered. The protective services around-the-clock work schedule, as well as the indications from the community, require provisions for daytime operations.

The rationale provided herein is not intended to rule out the possibility of future day preparatory programs in the above areas. However, it will be some time before these are implemented, and at this time it is anticipated that the request for facilities will have to alleviate the extensive demands for upgrading and retraining of the present work forces in these areas.

Curriculum Description

Curriculum Leading to a Diploma or an Associate in Applied Science

Curricula in these public service areas will range from short-goal certificate programs through diploma programs of one-year or more duration to Associate in Applied Science Degree programs of 90 quarter-hours in technical specialty, allied supporting and occupational general education instruction. Allied supporting and occupational general education classes may utilize other facilities of the college; however, it is anticipated that sufficient public service instruction of a technical specialty nature will require provisions for facilities assigned for this purpose.

Teaching and Learning Activities

Instructor Activities

Instructor activities will include lecturing, answering questions, leading discussions, demonstrating devices and instruments, demonstrating problem solving techniques, using visuals and audio-visuals, supervising student performance in using weapons and criminological instruments. In addition, activities will include preparing instructional materials, giving individual help to students and overseeing sophisticated equipment.

Instructors will demonstrate and explain the use of three dimension (mock-ups and models) and projected aids and the chalkboard. Closed circuit television may be used when appropriate.

Allied supporting and occupational general education instruction for the program will be provided by qualified and vocationally certificated personnel. These courses may or may not be taught by the technical specialty instructor. When the need for additional developmental instruction is identified, individualized instruction may be used.

Student Activities

In general, student activities will include listening to lectures, taking notes, participating in discussions, observing demonstrations, visuals and audio-visuals, working on individual and/or team projects and working with sophisticated equipment.

Emerging Concepts and Developing Trends

Technological advances are revolutionizing practices in all areas related to the public protection field. Future advances promise more innovations. These changes have greatly facilitated the task of protecting the public, but simultaneously they have made these tasks more complex. The community college can assist in upgrading, retraining and initially preparing qualified persons for the various fields of endeavor.

In order to meet the challenges of changing work force requirements, occupational education itself is in the process of change. To meet the needs for the individual's requirement for a broader based education, the single instructor concept is giving way to the use of several instructors in a team teaching situation. Another notable trend is visible in the curriculum structure; skills and concepts which are generalizable to occupational "job clusters" are receiving more attention and becoming the core curricula for many employment areas. This approach to instruction is expected to result in a greater development of adaptability in individuals to handle changes occurring in their fields. Similarly, those facilities supporting this educational trend should encourage the utilization of current teaching technology and devices.

Student Groups

Number of Students and Utilization of Facilities

It is projected that the student body in the public services will require two spaces having adaptability capabilities of a limited nature. These facilities would be used both day and evening to serve the somewhat specialized needs of instruction for the several public service areas previously defined. These classrooms (or laboratories) should be designed to serve groups of 20-40 students. While it is recognized that one general classroom might be appropriate for a large part of the instruction, it is recommended that a space be designed as two laboratories (actually modified classrooms) to provide the adaptability required.

Characteristics of Classes and Students

Class sizes are expected to range from 20-40 students in all courses. In the beginning, the clientele of the program will be a more mature group of employed persons until such time as the needs of the "supplemental" education and training of the public service areas are met. Increased participation of women in these areas should be planned for, and eventually the student body during the day will evolve to be recent high school graduates engaged in the educational phases of the various public services with "training" provided by the various public agencies on location.

Faculty and Staff

It is anticipated that 30 part-time instructors and one division chairman will be required to support the proposed program.

Spaces Needed to Implement the Instructional Program

Two instructional spaces will be required to support the program. These spaces may be called specialized, whereas they are actually modified classrooms. This will allow for some specialized instruction and will not hinder use of the spaces for general classroom activities. Table 24.1 summarizes

TABLE 24.1
SPACES REQUIRED FOR THE PUBLIC SERVICE PROGRAM

Type of Space	Units	Area Per Unit	Student Capacity Per Unit	Total Capacity	Total Area Sq. ft.
Modified Classrooms[a]	2	720	40	80	1,440
Offices					
Division Chirman	1				150
Part-time Instructors' Spaces	30	20			600
Sub-Total	31				750
Total	33			80	2,190

---

[a] Anticipated usage is 8-9 hours daily.

all the spaces recommended for this curricular area. The instructional spaces are more fully described in succeeding paragraphs.

Modified General Classrooms

It is recommended that *two* of these spaces be provided. Each space should be equipped with *40* student stations.

1. **Equipment and Furniture, Built-in**

A. Standard lighting treatment.

B. Convenience outlets along walls, six-foot centers.

C. Tackboard, four lineal feet.

D. Chalkboard, 16 lineal feet.

E. Standard window treatment, with darkening provision.

F. 2½ x 6′ x 20′ built-in storage cabinet along side wall, with lockable doors and shelving provided.[1]

G. Coaxial conduit or conduit chase for educational TV capability. (See explanation of RAMP requirements elsewhere in this document.)

H. 6′ x 4′ instructor's station, permanently mounted, with acid-proof/fire-proof top, sink, gas and water provided. Lockable cabinets below.[2]

2. **Equipment and Furniture, Movable**

A. 10 each, 4-student strip tables (1 classroom)

B. 40 standard student chairs, no arms

C. Instructor's chair or stool

D. 40 each, individual desks and chairs (1 classroom)

Where possible all instructional spaces should reflect the public service aspect of this curricular area. Students in this area should be motivated toward a strong commitment to good government, honest and efficient public service and fair play.

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[1] Cabinet required for storage of mock weapons, traffic controller devices, fingerprint kits, portable resuscitators, drunkometer, fire extinguishers, lie detector equipment and various other teaching devices for Police Science, Fire Science and Custodial and other specialized lab instruction devices.

[2] Limited demonstration activities involving fire, corrosive chemicals, staining chemicals, etc. will be carried out at this station.

Functional Relationships

Figures 24.1 and 24.2 are diagrams of functional relationships of facilities proposed for the Public Services Program.

FIGURE 24.1
RELATIONSHIP OF SPACES WITHIN THE PUBLIC SERVICES PROGRAM

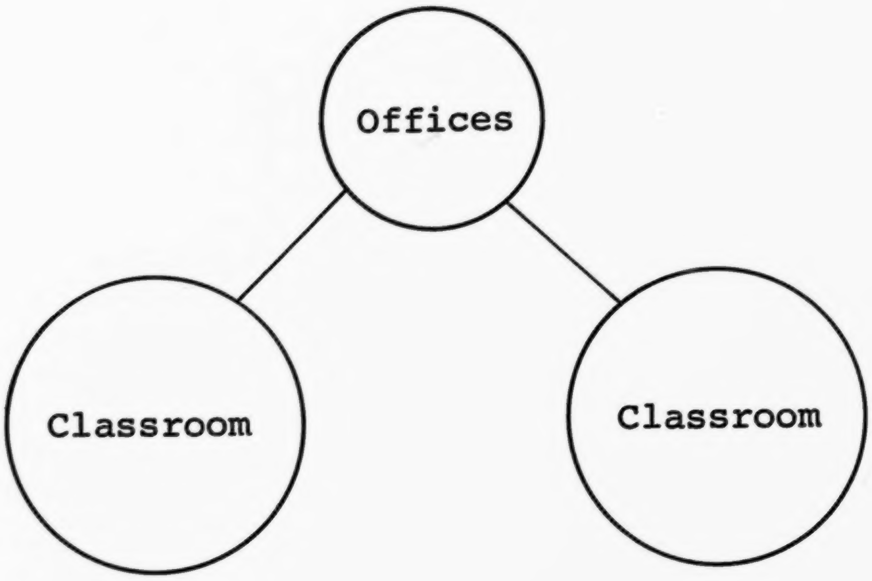
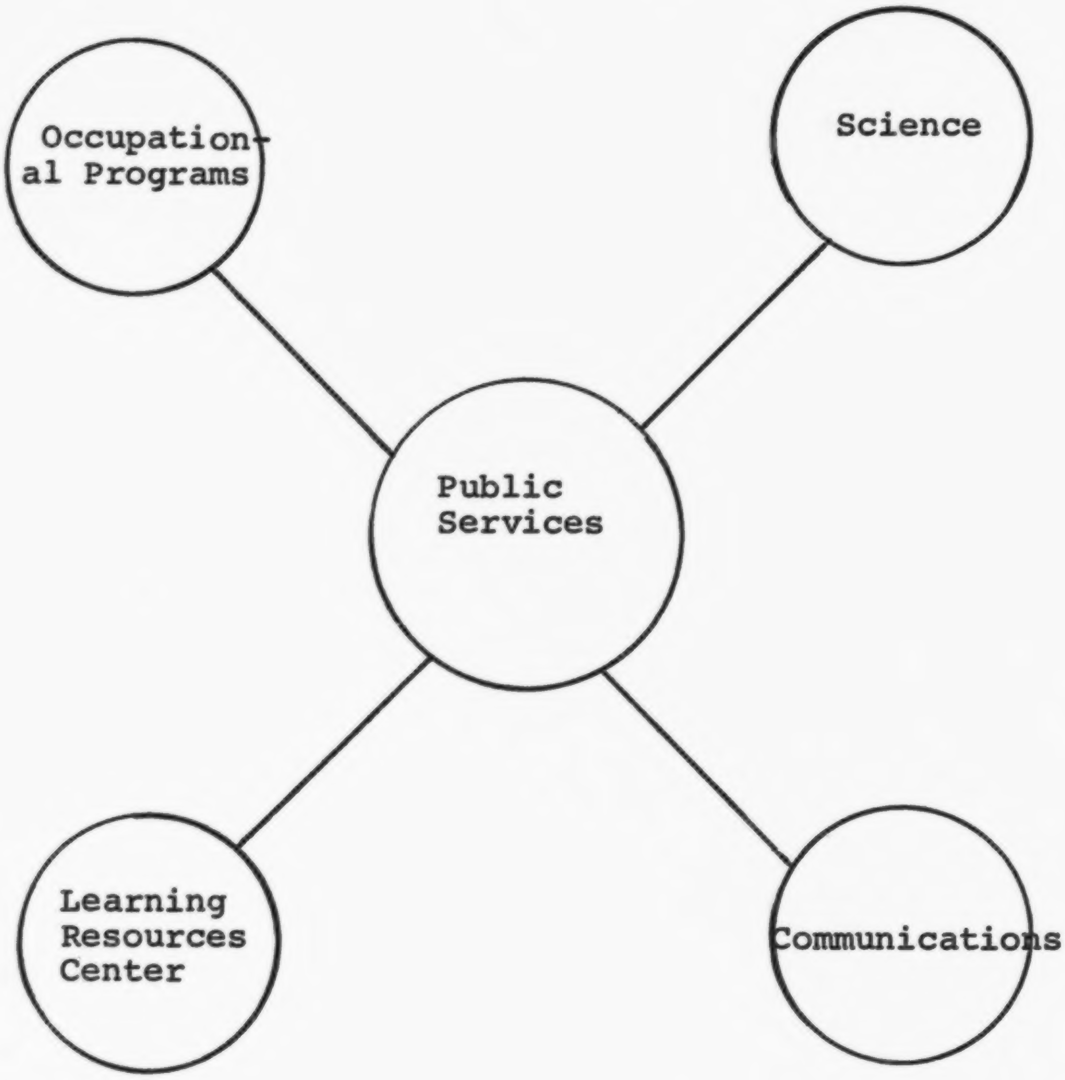

Offices
Classroom
Classroom

FIGURE 24.2

RELATIONSHIP OF PUBLIC SERVICES FACILITIES WITH FACILITIES OF OTHER PROGRAM AREAS


Occupational Programs
Science
Public Services
Learning Resources Center
Communications

XXV

FACILITIES FOR GRAPHICS AND MASS MEDIA

Philosophy and Objectives

The programs of instruction in the occupational areas of graphics and mass media prepare students for entry employment into various occupations related to visual communication, commercial and advertising art, technical illustration, photography and printing. The curricula are intended to allow the initial development of creative abilities in those enrolled and to provide instruction in the technical aspects of these occupations.

Visual communication in many forms—books, other printed copy, projected forms, posters and displays and three-dimensional models—plays an important role in contemporary life. The industry has been an important one since the invention of the printing press, having contributed significantly to the advancement of the causes of freedom, the development of a free enterprise system, the enculturation of the society and the evolution of scientific thought and technological sophistication. This industry is daily becoming even more important, for the volume of visually conveyed information is increasing at a rate which some have described as an "information explosion." It is the function of this industry to prepare and distribute information in ways in which the information carries the greatest possible impact.

The graduates of the curricula in graphics and mass media at Seattle Community College will find remunerative and satisfying careers in the vital visual communications industry.

Curricula and Courses

The curricula include the following:

1. Visual Communication
2. Commercial Art
3. In-plant Printing (small press)
4. Printing and Lithography
5. Photographic Technology
6. Photography

Visual Communications and Photographic Technology are two-year associate degree programs; Commercial Art and Printing and Lithography lead to the award of diplomas after two years of study; In-plant Printing and Photography are one-year certificate programs.

Teaching and Learning Activities

Teacher activities include lecturing, demonstrating devices and techniques, using chalkboard, using visuals and audio-visuals, using the overhead projector, answering questions, giving individual help, criticizing students' work, leading discussions, supervising performance and information tests, supervising practice in laboratories, conducting field trips and supervising and coordinating cooperative internship experiences for students in work situations.

Student activities include listening to lectures, observing demonstrations, visuals and audio-visuals, asking questions, participating in discussions, practicing use of devices and techniques, working on individual projects, working as members of a team, taking information and performance tests, performing laboratory and field exercises, working as interns in cooperative experiences and working creatively at the easel, drawing board and light table.

Emerging Concepts and Developing Trends

The graphics industry is in the process of expansion and change. Not only is the volume of information this industry handles increasing, but also the techniques for processing the visual matter are becoming more sophisticated. Photo offset, varityping, high speed color engraving and computer assisted typesetting and justification are but a few examples of techniques unknown just decades ago. The future holds the promise of additional improvements and innovations.

The uses of visual materials are becoming more and more diverse. The use of graphics in advertising, in commercial displays and as a carrier of information for expository, promotional or exhortatory purposes are traditional. There are new developments. Perhaps due to the evolution of a rational psychology and physiology of visual perception, a psuedo-science of attitude control and the elements of an activist learning theory, the use of printed and graphic materials is becoming increasingly systematic. This trend will escalate. The preparation of visual aids for the classroom, the board meeting or the new worker's orientation session are but a few examples of relatively new functions in the area of visual communications. More adaptations and uses of these techniques will surely follow.

Along with new developments in this occupational area, the process of education is also changing; the changes occuring have implications relevant here. The evolution from single-instructor concepts of occupational education to team-instruction methods is an example. Another notable trend is visible in curriculum structure: those skills and concepts which are generalizable to an entire cluster of occupations are considered most appropriate for occupational curricula. Such generalizability is highly to be desired, for it is realized that a primary objective of education is the development in the individual of adaptability. Colleges assume that responsibility—education—which they are best prepared to meet; industry assumes the responsibility—specific training—which it can discharge effectively. The facilities supporting educational programs must reflect these trends, encouraging multiple-use, discouraging high degrees of specificity and allowing adaptation to purposes perhaps as yet unforeseen.

Student Groups

Number of Students and Utilization of Facilities

It is projected that student personnel will be associated with this college unit to the extents indicated in Table 25.1. The usage of the facilities, in clock hours per day, is projected in Table 25.2. It is expected that the fraction of their total time spent in laboratories will be approximately one-third for associate degree students, one-half for students in diploma curricula and two-thirds for students in certificate curricula. In each case, it is assumed that students will spend approximately six hours per day on campus. The projections in Table 25.2 are based on these assumptions.

TABLE 25.1

PERSONNEL ASSOCIATED WITH GRAPHICS AND MASS MEDIA

	Students	Faculty
Visual Communications	25	1
Commercial Design	60	2
In-plant Printing	25	1
Printing and Lithography	30	1
Photographic Technology	40	2
Photography	20	1
Total	200	8

TABLE 25.2

CLOCK HOUR USAGE OF THE FACILITIES RELATED TO GRAPHICS AND MASS MEDIA

Area	Total Students	Mean Daily Hours per Student in Class	Mean Daily Hours per Student in Lab	FTE Students in Class	FTE Students in Lab
Visual Communications	25	4	2	17	8
Commercial Design	60	3	3	30	30
In-plant Printing	25	2	4	8	17
Printing and Litho.	30	3	3	15	15
Photographic Tech.	40	3	3	20	20
Photography	20	2	4	7	13
Total	200			97	103

The implications of Tables 25.1 and 25.2 are (1) that classrooms designed for 30 or 40 students will serve the peak needs of this area, (2) that seminar rooms to seat 15-20 students can profitably be used, (3) that the largest concentrations of students will occur in commercial art facilities, (4) that groups using printing facilities will be either small or intermittent, indicating that multiple-use of these areas must be achieved and (5) that a total of approximately 100 student stations must be provided in laboratory areas. An inference which may also be drawn is that certain facilities (i.e., a classroom capable of seating 60 students and an auditorium capable of seating 200) needed infrequently by students in this area should be made available to this college unit on a shared basis.

Characteristics of Classes and Students

Class sizes must be small in advanced courses in printing, since it is important that occasionally an appreciable amount of "hands-on" experience and extended "run time" experience must be incorporated into the students' programs. Individual study projects will characterize some of the course work in many of the subject matter areas dealt with here.

The clientele of these programs is expected to be heterogeneously distributed with respect to age, experience and ability levels; both sexes will be represented. In the main, the individuals will have relatively high creative abilities and many may have latent artistic talent. Those with the greatest chance for success will possess in combination a certain degree of manual dexterity and enhanced perceptions in the affective domain.

Table 25.1 presented previously enumerated the faculty members associated with this area. A more detailed analysis of staff requirements is given in Table 25.3. It is assumed that one of the first seven staff members listed will be the administrative supervisor of these curricula.

TABLE 25.3

FACULTY AND STAFF MEMBERS ASSOCIATED WITH GRAPHICS AND MASS MEDIA

Staff Person	Number
Printing Specialist	2
Advertising Art Specialist	2
Photographic Specialist	3
Projected Media Specialist	1
Secretary	1
Part-time Instructors	12
Total	21

The implications of Table 25.3 are that the following spaces should be provided:

1 Administrative Office	150 square feet
1 Reception Area	120 square feet
7 Staff Offices each 80 sq. ft.	560 square feet
12 Part-time Staff Spaces, each 20 sq. ft.	240 square feet
Total Office Area	1,070 square feet

Space Components of the Instructional Program

Figure 25.1 shows the number and type of spaces suggested to implement the instructional program. It will be noted that the office areas just described, three clasrooms and several specialized spaces have been included. The major specialized spaces consist of rooms for optical and chemical processing of images, for press operations, for layout and design of copy and for individual and small group work by students.

Table 25.4 summarizes the characteristics of the specialized spaces associated with Graphic Arts and Mass Media. Subsequent paragraphs describe these spaces.

TABLE 25.4

CHARACTERISTICS OF SPECIALIZED SPACES ASSOCIATED WITH GRAPHIC ARTS AND MASS MEDIA

Code	Space Description	No. of Units	Student Stations[c] Per Unit	Student Stations[c] Total	Approx. Area (sq. ft.) Per Unit	Approx. Area (sq. ft.) Total
A	Optical Process. Laboratory	1	(3)	(3)	1,400	1,400
B	Chemical Process. Laboratory	1	20	20	1,000	1,000
C	Press Room	1	20	20	2,600	2,600
D	Basic Design Laboratory[a]	(1)	30	30	(1,600)	(1,600)
E	Creative Design Laboratory[b]	(1)	20	20	(1,500)	(1,500)
F	Type Composition Room	1	(4)	(4)	200	200
G	Photography Studio	1	(6)	(6)	1,600	1,600
H	Layout & Commercial Design Lab.	1	20	20	1,200	1,200
I	Student Design Cloister #1	15	4	60	160	2,400
J	Student Design Cloister #2	6	10	60	400	2,400
K	Technical Library	1	—	—	150	150
	Total					12,950

---

[a] This space is identical to that described elsewhere as an "Engineering Drawing Laboratory" (see Chapters XV, XIX) and should *not* be replicated here. The laboratory elsewhere described is a shared facility. The assignable area has not been included in the total.

[b] This space is identical to one described elsewhere in Chapter XIV as a "Drawing and Painting Studio," and should *not* be replicated here. However, it is suggested that the space assigned to this facility perhaps be augmented in order to absorb students from this area.

[c] Figures in this column enclosed by parenthesis indicate the number of work stations only; students are not expected to occupy these stations for more than brief intervals.

A. **Optical Processing Laboratory**—This laboratory is a set of work spaces for students enrolled in several different courses in the curricula. It is expected that seldom will there be large groups concentrated for prolonged periods in these spaces; rather, students will come to this facility for specific, short-time use of the apparatus and equipment housed here.

The equipment will include flat-bed cameras, color separation cameras, copy cameras and the associated supporting equipment. The significant part of this area is a set of three darkrooms, one for the color camera, one for the black and white camera and one for the Kimbrell camera. These rooms should be equipped with safe-lights and have "in-use" warning lights at entry doors. Entry-ways themselves should be of the door-vestibule-door type, with "light-lock" arrangements, for complete darkness will be required during portions of the time the darkrooms are in use.

B. **Chemical Processing Laboratory**—This laboratory is a work space for students enrolled in several different courses of these curricula, as well as serving as a major laboratory for introductory courses in photography. It is expected that for certain periods of the day, group instruction will occur here, and that for the remainder of the time the facility will be available for use by individuals.

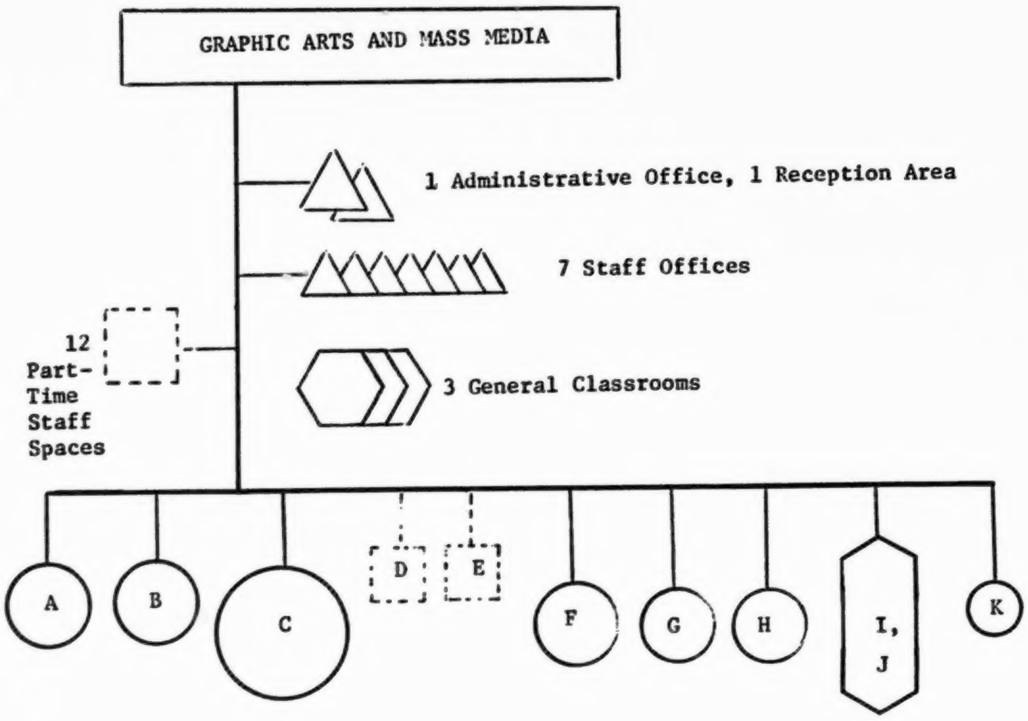
The equipment will include sinks, trays and tanks for the development washing and fixing of film, contact printers, dryers, enlargers and other conventional photographic darkroom paraphernalia. Base and wall cabinets should be provided for storage of chemicals and supplies. The room should be equipped with safe-lights and an "in-use" warning system. Complete darkness will be required during major parts of the time the room is in use. Entry-ways should be of the door-vestibule-door type, with "light-lock" capability. It may be most practical to provide a cellular structure within this laborotory so that certain sections may be in total darkness while others are in "safe-light" conditions. The room should contain twenty 3′ x 3′ individual developing booths.

C. **Press Room**—This area is a laboratory for students studying printing. Students will obtain here initial familiarization with press equipment and will have some operational experience in press activities. Provsion for one 24″ press, one 20″ press, one two-color press, one webfed press, six duplicating presses and three letter presses will be made along with the supporting equipment (carts, dollies, paper racks, etc.) associated with them. Easy access to an in-room storage area and an assembly and collation area must be provided.

Noise suppression is a factor in the design of this space, as is the control of vibration. It may be desirable to locate this facility in a somewhat re-

FIGURE 25.1

SPACES REQUIRED TO IMPLEMENT THE INSTRUCTIONAL PROGRAM IN GRAPHIC ARTS AND MASS MEDIA


GRAPHIC ARTS AND MASS MEDIA
1 Administrative Office, 1 Reception Area
7 Staff Offices
12 Part-Time Staff Spaces
3 General Classrooms
A
B
C
D
E
F
G
H
I, J
K

A. Optical Processing Laboratory
B. Chemical Processing Laboratory
C. Press Room
D. Basic Design Laboratory (a remote facility)
E. Creative Design Laboratory (a remote facility)
F. Type Composition Room
G. Photography Studio
H. Layout and Commercial Design Laboratory
I, J. Student Design Cloisters and Work Rooms
K. Technical Reference Room

mote location from the Optical Processing Laboratory, previously described. Humidity control is another significant variable.

It is emphasized again that the major purpose of this laboratory is generalizable instruction and that the development of high degrees of skill in press operators is a function which will have to be supplemented by experiences elsewhere. Internship and cooperative training experiences in industrial or commercial print shops can assist in strengthening specific skills.

This is a "high visibility" area. The press room should contain an assembly and collation area. The area will be equipped with collating racks, work tables, mechanical collators, folders, binders, shears, stitchers, perforators and the like. The space should have access to the exterior for use in dispatching finished products to their destinations. Adequate counter space and in-room storage should be provided.

The press room must also be provided with space for materials storage. This highly important space should be designed for the storage of paper of various sizes, textures, colors and weights; of inks and paints; of photographic materials and other relevant supplies. The space should be easily accessible from both the press area and the assembly area.

D. **Basic Design Laboratory**—See "Engineering Drawing."

E. **Creative Design Laboratory**—See Art Facilities.

F. **Type Composition Room**—A small space, with easy access to the Optical Processing Laboratory and to certain Student Design Cloisters (see below) should be provided. Four stations—one each for the varityper, hand-set type, Executive type and the headliner—are needed. Adequate storage for supplies and various fonts of type is required.

G. **Photography Studio**—This space is to be used as a "shooting studio" primarily for photography classes but is available as a work space for other students as well. It will contain a small work bench for the construction of props, an area for painting backgrounds, and facilities for construction of models as well as space for portrait, advertising and creative photography. Provision for the storage of camera accessories, for the mounting of lights and for the set up of cameras in various positions should be made.

It is expected that this space will serve to supplement field photography experiences of the students enrolled in these courses. It is projected that the utilization of this space by occupational students will not saturate its schedule; therefore, this facility is available for sharing with other areas in the college.

H. **Layout and Commercial Design Laboratory**—This facility is a major classroom-laboratory space for Commercial Art students. It will provide initial learning experiences in layout, poster design, the use of color, the use of various art media, the design of copy for the camera, the use of airbrush techniques and other techniques of the preparation of visual materials.

The room will be furnished with 20 drawing tables (2′ x 3′) and stools, five light tables and a room-width counter for storage of supplies. Full RAMP facilities should be provided for. At table height, the illumination level of color-corrected light should be 80 foot candles.

I., J. **Student Design Cloisters**—Because a significant fraction of student time for those enrolled in some of the curricula dealt with here will be spent either in individual work or in one-to-one relationships with an instructor, carrel-type spaces to accommodate small groups of students have been suggested. "Cloister" spaces to contain work stations either for four students (Cloister No. 1) or for ten students (Cloister No. 2) are suggested. (Groupings of four and ten stations, respectively, are suggested for these cloister spaces on philosophical grounds that these are the two sizes of small-group units which seem to interact best, combining maximum individuality of endeavor with maximal committee dynamics.)

The student stations in each cloister should consist of a drawing table; a light table; racks for paints, inks, paste, scissors and other supplies; a lamp and a stool. Both table and stool should be adjustable to accommodate individual differences.

Each station should be equipped with three sets of drawer spaces so that each station could service three different students during the span of a day. To maximize the effectiveness of these cloisters, they should be distributed as follows:

Located Near	Cloister Type	Number
Press Room	#2	2
	#1	4
Chemical Processing Lab	#1	4
Commercial Art Lab	#1	7
	#2	4

These cloisters should *not* be closed-off rooms, but should be open islands in relatively large spaces. Free circulation of an instructor within and between these cloisters must occur. They should provide the environment for individual work, creativity, productivity and should encourage the tutorial relationship between student and instructor.

K. **Technical Library**—A space to house a small collection of relevant references should be provided. In order that supervisory control be readily maintained, this space should be physically near the reception area.

General Comments

Display areas for student work should be provided throughout this facility; the corridors may be used for this purpose.

Ingress and egress to the printing facilities is required. A service drive and loading ramp must be provided for delivery and dispatch of printing shop materials.

Students in photography will be involved appreciably with field work. Convenient egress for these students should be provided.

Relationships of Graphic Arts Facilities

Figure 25.2 shows the relationships between the spaces within the facilities for Graphic Arts and Mass Media. Figure 25.3 shows the relationship between these spaces and other facilities on campus. Because of the need for the use of engineering drawing laboratories in the instructional program for Graphic Arts and Mass Media, it is suggested that the Graphic Arts facilities be physically associated with facilities for pre-engineering.

Spaces Infrequently Used by Students in Graphic Arts and Mass Media

In addition to their use of the specialized spaces previously described, students in the occupational area of Graphic Arts and Mass Media will also utilize other spaces on campus. For example, general education experiences appear in all the occupational-curricula of this area; hence, these students will be scheduled into various communications, social studies, humanities and other such classrooms. Table 25.5 identifies the types of spaces needed and the estimated clock hour usage of each.

FIGURE 25.2

RELATIONSHIPS BETWEEN SPACES IN FACILITIES FOR GRAPHIC ARTS AND MASS MEDIA

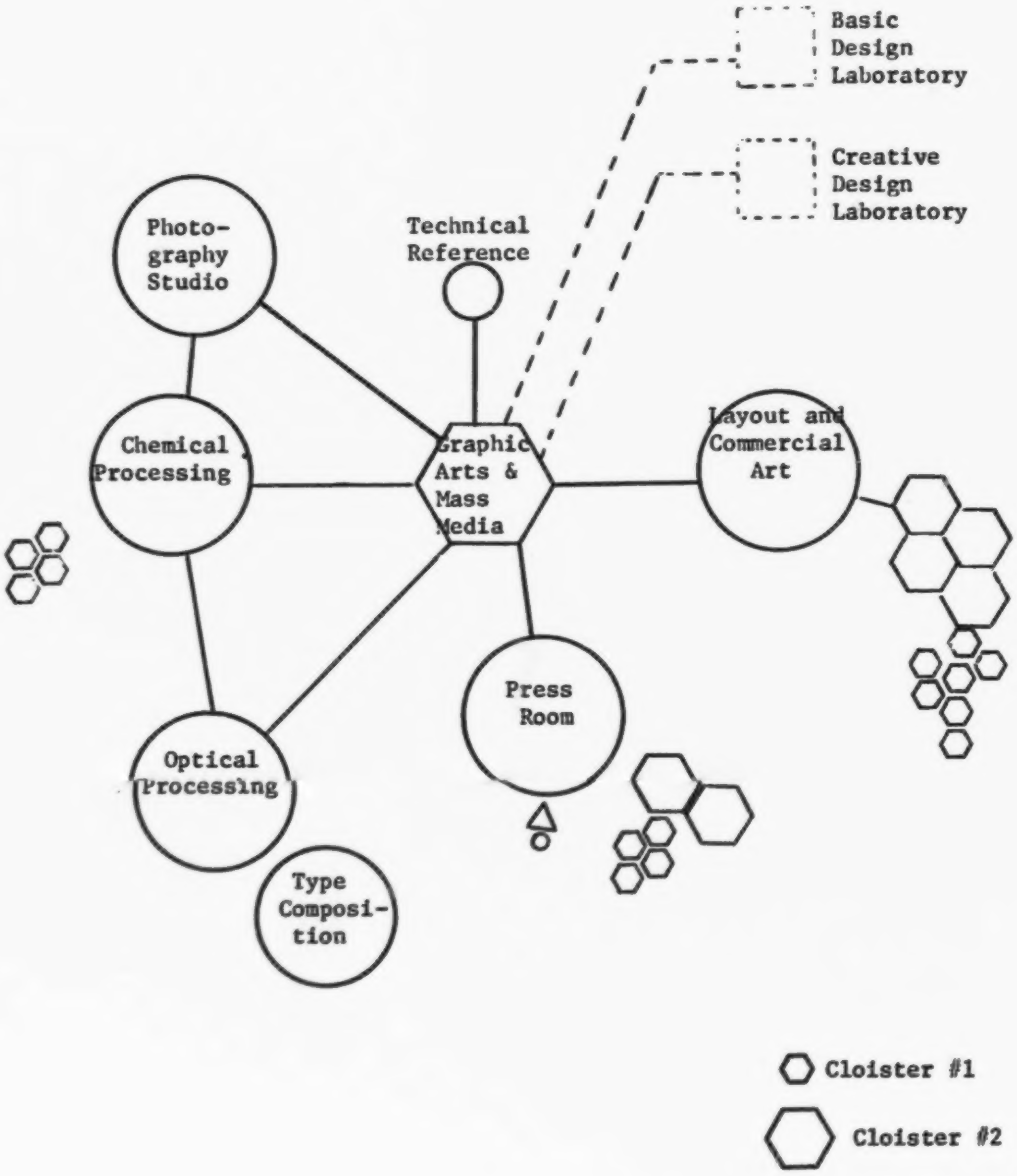

Basic Design Laboratory
Creative Design Laboratory
Photography Studio
Technical Reference
Chemical Processing
Graphic Arts & Mass Media
Layout and Commercial Art
Press Room
Optical Processing
Type Composition
Cloister #1
Cloister #2

FIGURE 25.3

RELATIONSHIPS BETWEEN FACILITIES FOR GRAPHIC ARTS AND MASS MEDIA AND OTHER FACILITIES ON THE CAMPUS

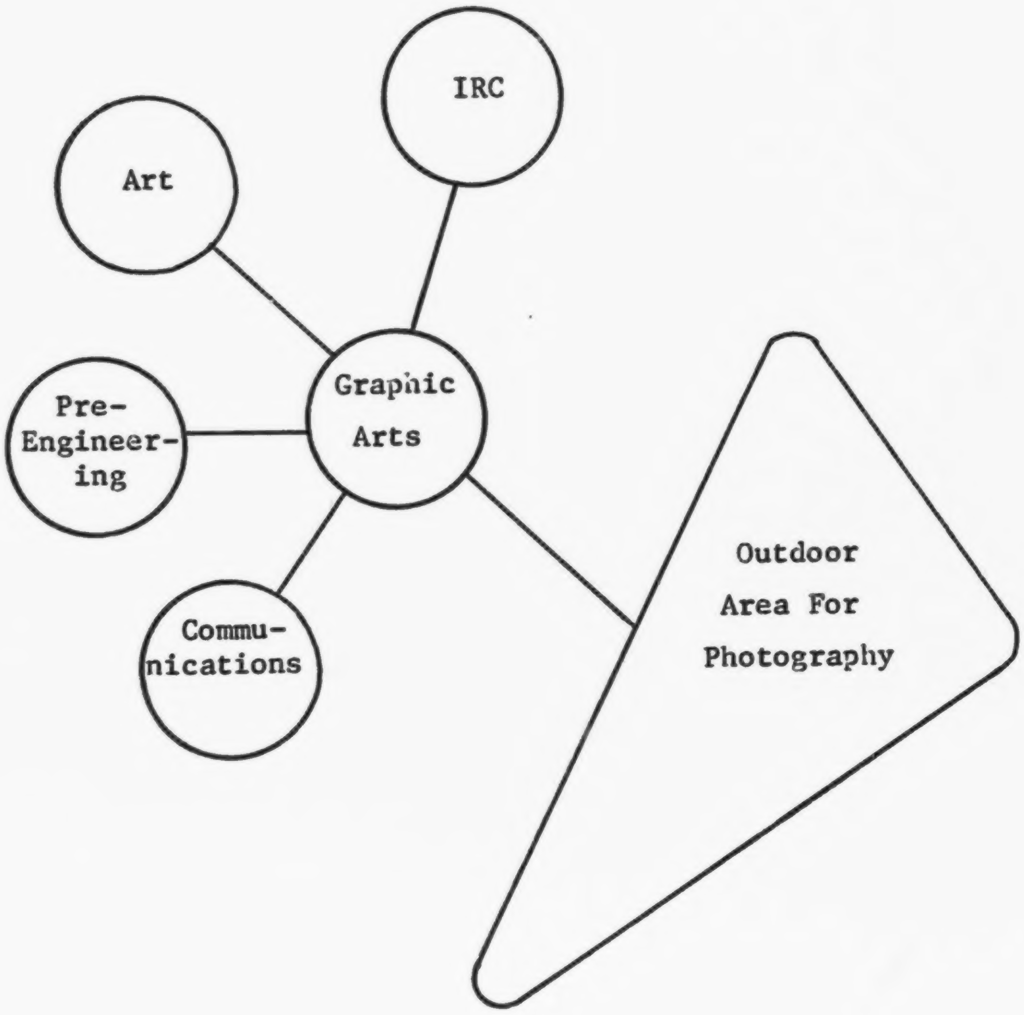

IRC
Art
Graphic Arts
Pre-Engineering
Communications
Outdoor Area For Photography

TABLE 25.5

SPACES REQUIRED FOR OCCASIONAL USE BY GRAPHIC ARTS AND MASS MEDIA STUDENTS

Type of Space	Units[a]	Approximate Usage (clock hours/week)
Communications Classroom	1	20
Mathematics Classroom	1	7
Engineering Drawing Lab	1	6
Chemistry Classroom	1	2[b]
Chemistry Laboratory	1	3[b]
Social Studies Classroom	1	12
Office Occupations Laboratories	2[c]	10[b]
Business Administration Classroom	1	4
Data Processing Facilities	1	3[b]
Humanities Classroom	1	9

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[a] For this table, a "unit" is interpreted as a space having more than 20 but less than 40 student stations.

[b] For one term only; other data in this column are for entire academic year.

[c] One typing lab, one accounting lab.

Summary of Space Recommendations

Table 25.6 lists all the spaces associated with this college unit. The figures enclosed in parenthesis relate to spaces assigned to other college units or used only intermittently and have *not* been included in the totals shown. Appropriate cross-references are given in the "Code" column of the table.

TABLE 25.6

SUMMARY OF SPACE NEEDS FOR GRAPHIC ARTS AND MASS MEDIA

			Student Stations		Approx. Area (sq. ft.)	
Type of Space	**Code**	**No. of Units**	**Per Unit**	**Total**	**Per Unit**	**Total**
Administration Office	Table 25.3ff	1	—	—	150	150
Reception Area	Table 25.3ff	1	—	—	120	120
Staff Offices	Table 25.3ff	7	—	—	80	560
Part-time Staff Spaces	Table 25.3ff	12	—	—	20	240
Optical Processing Lab	Table 25.4-A	1	(3)	(3)	1,400	1,400
Chemical Processing Lab	Table 25.4-B	1	20	20	1,000	1,000
Press Room	Table 25.4-C	1	20	20	2,600	2,600
Basic Design Lab[a]	Table 25.4-D	(1)	(30)	(30)	(1,600)	(1,600)
Creative Design Lab[a]	Table 25.4-E	(1)	(30)	(30)	(1,500)	(1,500)
Type Composition Room	Table 25.4-F	1	(4)	(4)	200	200
Photography Studio	Table 25.4-G	1	(6)	(6)	1,600	1,600
Layout & Com.	Table 25.4-H	1	20	20	1,200	1,200
Student Design Cl. #1	Table 25.4-I	15	4	60	160	2,400
Student Design Cl. #2	Table 25.4-J	6	10	60	400	2,400
Technical Library	Table 25.4-K	1	—	—	150	150
General Classrooms	Figure 25.1	3	25	75		1,500
Total				255		15,520

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[a] To be located remotely, space is elsewhere assigned.

XXVI

PLANT OPERATIONS FACILITIES

Philosophy and Objectives of Service Program

The overriding purpose of the plant operations program is to serve as a supporting function to the instructional program of the College. The buildings must be kept open and clean and in an acceptable state of repair for the most effective and efficient utilization. This is a critical supporting role for which adequate facilities must be provided so that the College may operate its instructional program around-the-clock on a year-round basis. Some phases of the program such as data processing, IRC and the administrative functions may operate seven days per week.

The secondary objectives of the plant operations program are summarized as follows:

1. Encourage efficient plant operation.
2. Provide effective custodial services convenient to students and staff.
3. Give effective support to campus security.
4. Enhance the safety of occupants.
5. Promote the health of occupants by maintaining a high standard of sanitation.
6. Promote and maintain attractive surroundings.
7. Lend direct support to central maintenance functions.

Functions and Services to be Housed

The following is a list of the specific functions and services for which adequate facilities must be provided:

1. Daily and periodic cleaning of the buildings and campus.
2. The periodic scrubbing and waxing of floors.
3. Continuous and complete lawn care including mowing, trimming, edging and watering of areas in the immediate vicinity of the buildings.
4. Receiving and storing bulk instructional and office supplies.

5. Operating and servicing heating, ventilating and air conditioning systems.
6. Operating and servicing building service systems.
7. Opening the plant for regularly scheduled and emergency functions.
8. Receiving and storing general supplies and equipment.
9. Performing minor maintenance tasks in support of central maintenance.
10. Test, operate and service safety and alarm devices.
11. Give operational support to the campus security program.
12. Provide campus-wide delivery and distribution service.

Number and Types of Personnel Involved in the Operations Program

According to formulas and standards used by the Operating Department of the Seattle School District, approximately 45 persons would be required to staff the custodial service program of the North Campus. The breakdown would be as follows:

Day shift	7
Afternoon shift	7
Graveyard shift	31
Total	45

The operating staff would include a plant manager, matrons, engineers, assistant custodians and janitors.

The cleaning load of janitors would be from 13,000 to 18,000 square feet per day. This work load includes all phases of the work, including weekly, monthly, annual and periodic cleaning tasks. The bulk of the work in cleaning and caring for the buildings will be accomplished by the graveyard shift. It is apparent that the plant must be planned for "round-the-clock" operating and cleaning services.

The six major functions of the operating staff are:

1. Plant operations
2. Custodial services
3. Plant security
4. Grounds maintenance
5. Supply management services
6. Minor building maintenance

Space Descriptions and Their Relationships

Central Supply Area

A central supply area should be provided to store bulk items of supply, instructional materials, furniture and equipment. Supply and equipment items will be received and distributed throughout the plant from this central point.

The central supply room should be located for ease of supply distribution as well as access for service. The central receiving dock should be located adjacent to the central supply room. Vehicular access to the receiving area is essential. Similarly, vehicular access to other critical points of service must be provided for direct delivery to other areas, where needed.

This space should have one large door with an opening at least eight (8) feet wide and twelve (12) feet high. Doors should be equipped with dead locks. Open type shelving should be provided which is at least twenty-four (24) inches wide and of twenty-four (24) inch vertical spacing. Approximately one-fourth of the area should be for bulk-type storage in large boxes and for furniture.

This space should contain at least 3,000 square feet and may be divided into more than one room. A small office for a supply manager or receiving clerk is needed. This office should have a dutch door and a wire glass panel opening onto the receiving area. An area for re-packaging and wrapping should be incorporated into the space.

Central Receiving Dock

The central receiving dock should have a minimum of seventeen (17) feet roof clearance to accommodate a "road rig." The platform should have a hydraulic plate on the edge to accommodate the different heights of truck beds. An eight (8) foot wide ramp should run from the platform to the ground level to accommodate equipment on wheels and hand trucks. Many deliveries will be made by side opening vehicles.

The receiving dock should be located adjacent to the central supply area. An electric jitney and fork lift could be used in conjunction with carts to unload, lift, move and distribute equipment and supplies about the campus.

Decentralized Storage Facilities

Storage or supply rooms are needed throughout the entire plant. Each building or major building component should have a large storage room for the storage of extra furniture and equipment and bulk items. For the most part, other decentralized storage rooms will be auxiliary to instructional and other spaces and are considered separate here. However, each building or building wing should be provided with a room of 300 to 400 square feet in size and located at ground level in a generally central location. Positive means of adequate ventilation should be provided.

Likewise, each building should have a decentralized custodial supply room for custodial service operations. These rooms should be equipped with shelving, tool hangers, a small work bench, a slop sink and a water source with hot and cold water. This room should be located adjacent to the large decentralized store room in each building at ground level. Adequate ventilation is needed.

Plant Workshop

A space of 400 to 500 square feet is needed for performing minor plumbing and electrical maintenance tasks, the minor repair and servicing of custodial equipment, glass cutting and minor painting and refinishing tasks. Work areas for plumbing, glass cutting, painting and refinishing and electrical repairs should be planned. Storage bins for minor plumbing fixture parts, electrical service needs, paints, glass, minor hardware items such as bolts, nuts and screws should be provided.

This area should be well ventilated and materials used for interior finishes should be appropriate.

This facility should be located in the immediate vicinity of the central supply area, the receiving dock and the plant manager's office.

Plant Manager's Office

An office approximately 120-150 square feet is needed for the plant manager. This room should have a telephone, an executive desk and chair, at least two side chairs, three to four filing cabinets, a bulletin board, an outbox unit with ten (10) boxes for outgoing letters, work orders, inspection forms, etc. The room should also be equipped with an intercommunications system to all parts of the plant. Key storage for master key system should be provided in the plant manager's office.

The plant manager's office should be located in the vicinity of the plant workshop and the central supply area. Visual control of the receiving area is desirable.

Secretary's Office

An office is needed for the secretary. It should be adjacent to the manager's office. Furniture and equipment should include a secretary's desk and chair, four to six filing cabinets, 2 side chairs for waiting, electric typewriter and telephone. A supply storage room should open onto the secretarial space. It should be equipped with floor to ceiling shelves.

Facilities for the Operating Staff

The following are needed for the operating staff with separate facilities for each sex:

1. Small dressing rooms with space for lockers. Ten full length lockers should be provided for women and 35 for men. Fifteen or more additional lockers should be provided for other personnel.
2. Small shower rooms with two shower heads each adjacent to dressing areas.
3. Small toilet rooms with at least one fixture of each type.
4. A small lounge area to serve both sexes. Space for a small electric stove, refrigerator and for four (4) four-place tables should be provided.

These facilities should be located in the vicinity of the plant manager's office. Room finishes and appointments conducive to adequate sanitary standards are required.

Custodial Service Closets

A small custodial closet should be provided as an auxiliary unit to every pair of men and women's toilets and in other areas also such as the kitchen, the shower and dressing rooms in the gymnasium, the central administrative offices etc. One janitor will clean approximately 15,000 square feet of floor space and he is dependent upon the custodial supply closet as a source of water, supply of materials and equipment as he performs his cleaning functions. Every floor and every building should have at least one custodial supply closet. Large building components will have several.

The custodial supply closet should be at least 40 square feet in size and equipped with one wall of shelves of 16″ vertical spacing, a tool hanging peg board, additional open space for a cart and a floor machine on the floor. Floor-level mop rinsing basins should be provided in all custodial closets. Likewise, a floor drain should be available in all custodial closets.

Plant Security Office

An office of approximately 200 square feet should be provided for the plant security officer. The room should have space for two desks and two chairs, filing cabinets and a time clock station. Lockers for at least six persons should be in this space as well as cupboards for storage.

Vertical Traffic Movement

In all buildings more than one story in height, elevators or ramps should be provided to move equipment, supplies, etc. from one area of the plant to another. These facilities should also be planned to serve students in wheel chairs or otherwise physically handicapped.

Waste Disposal Facilities

The College will contract for disposal of wastes; therefore, no incineration facilities are required. Space should be provided in strategic areas for storing disposal equipment similar to the "Dempsey-Dumpster." Service drives are needed to their locations, and platforms and screens are needed to receive them. An area for waste disposal should be convenient to each building. Depending upon campus layout, several buildings could perhaps be served by one disposal area.

A system is needed for the disposal of tests, confidential student documents and similar confidential items. The use of "Shredders" should be investigated.

Covered Parking Sheds

Storage space is needed to house a fork lift, a panel body truck and at least four electric cart delivery vehicles.

Service Access

A service drive and a paved service area should be provided for the loading dock and central supply area. Service access from this area should be convenient to other delivery and service points on the campus.

Space Guidelines

Included in Table 26.1 is an estimate of the number and type of spaces required and guidelines regarding the amount of net square feet for each.

TABLE 26.1

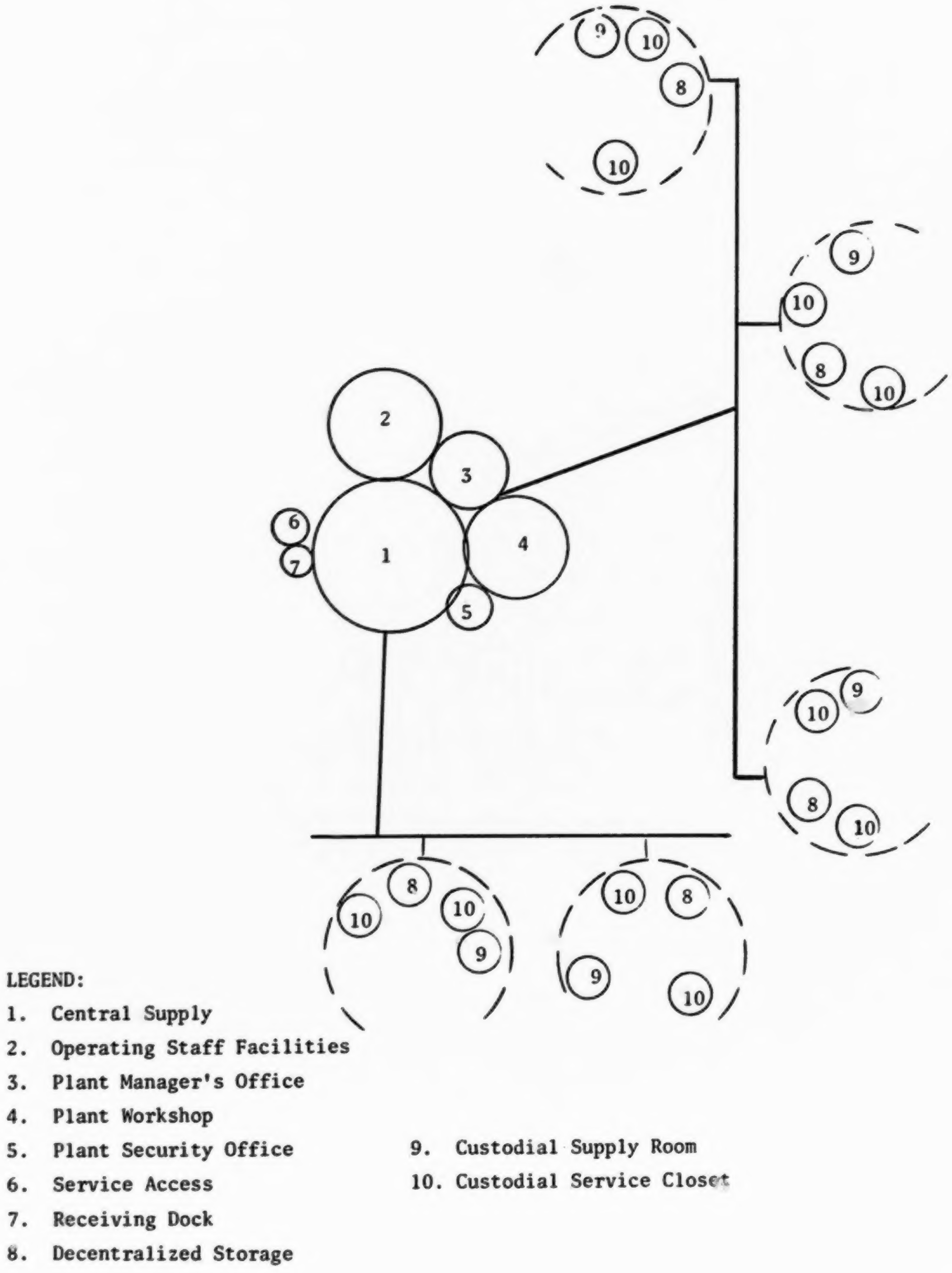
SUMMARY OF SPACE REQUIREMENTS FOR THE BUILDING OPERATIONS PROGRAM

Type of Space	No. of Units	Total Area Sq. Ft.
Central Supply	1	3,000
Receiving Dock	1	200
Decentralized Storage	8 (est.)	3,200
Plant Workshop	1	500
Plant Manager's Office	1	150
Secretary's Office & Storage	1	170
Operating Staff Facilities	2	400
Custodial Supply Closets	25 (est.)	1,000
Plant Security Office	1	200
Elevators	8 (est.)	800
Garage	1 (4 stall)	120
Waste Disposal Facilities	—	——
Student Toilets	32	7,200
Utilities and Air Handling	—	8,000
Total		24,940

Space Relationships

Figure 26.1 indicates the general pattern of desirable space relationships.

FIGURE 26.1
GENERAL RELATIONSHIPS—CAMPUS PLANT OPERATIONS FACILITIES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LEGEND:

1. Central Supply
2. Operating Staff Facilities
3. Plant Manager's Office
4. Plant Workshop
5. Plant Security Office
6. Service Access
7. Receiving Dock
8. Decentralized Storage
9. Custodial Supply Room
10. Custodial Service Closet

Other Special Considerations and Suggestions

1. Suggest that consideration be given to the provision of a low pressure steam heating or low pressure hot water heating system with fully automatic controls which would not require constant surveillance by an engineer during varying loads in mild weather.
2. Higher pressure package steam generating units should be considered to meet the needs of: Drycleaning, Power Sewing, Tailoring, Automotive, Dressmaking and Steam Engineering classes.
3. Zoned heating and air-conditioning, budget permitting, should be considered for maintaining comfortable temperatures in special areas.
4. The extra cubic feet of air displacement for removing tobacco smoke during peak loads in smoking areas should be provided. (Dining rooms, student centers, faculty rooms, meeting rooms, etc.)
5. Heating needs for areas used during off-school hours should be considered. Offices, IRC, administration and perhaps other selected areas would be frequently used on weekends, after school hours and during vacation periods.
6. Installation of illuminating devices that could be changed and serviced by one man standing on the floor would be safer and would encourage more frequent service. Auditorium, gymnasium and other high-ceiling areas might be serviced from a crawl space. "Group re-lamping" of fluorescent lamps would be considered, but the fixture should be a design that makes re-lamping and cleaning practical.
7. Window washing should be possible if windows could be reached easily from the floor or ground without the use of special equipment or tall ladders that might be cumbersome. Outside screening discourages good cleaning practices. Special consideration should be given to this problem.
8. Windows should be permitted to "open" in order to reduce torn shade and drapery damage and at the same time not become a safety hazard.
9. Heavy-duty garbage can washing facility with a large volume of hot water and steam located near the garbage pick-up area should be provided.
10. Zone-key systems with grand master provision provides greater security and avoids conflict of programs.

11. Vandal-proof techniques should be planned to isolate sections of one building that may be independent of other parts of the same building on certain occasions. Each zone or area should be provided with its own telephone service, lavatories and drinking fountains.

12. Provide ampmeters instead of indicator lights on main switch panels to show the load on electric motors.

13. Walls that can be washed and rinsed, floors without too many corners and floor-stops for doors and otherwise easy-to-clean surfaces will encourage a more regular cleaning program.

14. Sidewalks, stairways, inclines, roofs and drains should be so located and constructed that snow and ice removal procedures can be held to a minimum. Consideration should be given to electrical devices for melting snow on steps to building entrances that serve heavy student traffic.

15. Toilet rooms should be uncluttered with fixtures—wall mounted wherever possible. Too many doors hinder cleaning procedures. Smooth, hard, unbroken wall and floor surfaces encourage good cleaning habits. Floors should slope to the drains in the toilet rooms. Facilities should be provided for 250-300 staff members and 5,000 full-time equivalent students.

16. Smokers and non-smokers should have several areas restricted to eating, lounging and smoking so that it will be possible to eliminate smoking and eating in the lavatories.

17. A master key-lock system should be selected at the appropriate time to provide a maximum of security to critical areas and at the same time provide needed access by authorized persons to required rooms and spaces.

18. A gasoline pump and a buried gas tank should be provided for the dispensing of gas to college-owned vehicles. This pump and tank should be located for control adjacent to the supply receiving dock area.

19. A signaling device such as an electronic carillon should be provided to indicate the beginning and ending of class periods. Also, tamper-proof time clocks should be located in strategic places in corridors and elsewhere as a service to faculty and students.

20. Care should be exercised in the selection and location of thermostats in offices, instruction rooms and semi-public spaces. Thermos-

tats in offices should be adjustable by office occupants, while those in instruction rooms and semi-public places should not be.

21. An underground sprinkler system should be provided for all landscaped areas.
22. Hose bibbs should be provided at strategic locations on the exterior of all buildings.
23. Provisions should be made for a radio-loop system for use by the operations office for maintaining contact with custodial and operations personnel.
24. It is noted here that *no* program clock or inter-communications system is to be provided between the central office and classroom areas.

APPENDIX A

ELECTRICAL, ELECTRONICS AND PRE-ENGINEERING EQUIPMENT LIST

Equipment for Basic DC, AC Laboratory

The following equipment will provide 65 student stations (students working in pairs).

Quantity	Type
33	Audio Signal Generators
33	Vacuum Tube Voltmeters
33	Volt—Ohm—Milliameter
25	Tektronix Type 561A Ascilloscopes
33	Low Voltage Regulated DC Power Supplies
33	DC—AC Channel Mounted Power Supplies
33	Student Laboratory Equipment Units, Philco Item 29
3	Lecture Demonstrator Units Philco Item I, IA
3	Tool Sets

Equipment for Electron Tube and Semi Conductor Laboratory

The following equipment will provide 24 student stations (12 work stations).

12	Audio Signal Generators
6	RF Signal Generators
12	Vacuum Tube Voltmeters
12	Volt—Ohm—Milliameters
12	Tektronix Oscilloscopes Type 56IA
12	Low Voltage D-C Supplies. (channel mount)
12	AC—DC Voltage Supplies. (channel mount)
12	Student Laboratory Equipment Units, Philco Item 29 and 29A.
1	Lecture Demonstration Unit Philco Item 1, 1A and 27
1	Vacuum Tube Tester

APPENDIX A (Cont'd)

Quantity	Type
1	Transistor Checker
1	Transistor Curve Tracer Tektronix 575
1	Set Tools

Equipment for Basic Circuits Laboratory

The following equipment will provide 40 student stations. (20 work stations).

15	Audio Signal Generators
15	RM Signal Generators
20	Vacuum Tube Voltmeters
20	Volt—Ohm—Milliameters
20	Oscilloscopes—Tektronix 515A
10	Grid Dip Oscillators
20	Student Laboratory Equipment Units Philco Item No. 3, 6, 8, 4 and 21A
2	Lecture—Demonstration Units; Philco Item 2
1	Vacuum Tube Tester
1	Transistor Tester
20	AC—DC Power Supply (channel mounted)
20	Low Voltage Regulated DC Supply (channel mounted)
10	AM-FM Radios
1	Single Side Band Transceiver
1	Radio Transceiver
1	Set Tools

Equipment for Advanced Circuits Laboratory

The following equipment will provide 40 student stations.

20	Vacuum Tube Voltmeters
20	Volt—Ohm—Milliameters
10	Audio Signal Generators
10	RF Signal Generators

APPENDIX A (Cont'd)

Quantity	Type
1	Vacuum Tube Tester
1	Transistor Tester
20	Oscilloscopes—Tektronix 561A
1	Memory Oscilloscope
2	Oscilloscope—Tektronix 547
2	Pulse Generators
2	Differential Voltmeter, John Fluke
1	Camera—Scope Mount Type
20	Student Laboratory Equipment Units Philco Item No. 3, 6, 8, 4 and 21A
2	Lecture Demonstrator Units Philco Item No. 2, 5, 7 and 20.
4	Color Television Receivers
20	Black and White Television Receivers
20	Low Voltage Regulated DC Supplies (channel mount)
20	AC-DC Voltage Supplies (channel mount)
2	Sets Tools

Equipment for Industrial and Avionics Laboratory

The following equipment will provide 40 student stations:

1.	20	Vacuum tube voltmeters
2.	20	Volt—Ohm—Milliameters
3.	5	Audio signal generators
4.	10	R F signal generators
5.	10	Oscilloscopes—Tektronix 561A
6.	4	Oscilloscopes—Tektronix 547
7.	1	Oscilloscope, memory type
8.	1	Camera scope mount
9.	1	Transistor curve tracer Tektronix 575
10.	2	110V audio generators
11.	1	Radar-weather mapping
12.	1	Auto pilot

APPENDIX A (Cont'd)

	Quantity	Type
13.	2	Communication transceivers
14.	2	Direction finding systems
15.	10	Servo amplifiers
16.	5	Servo systems
17.	40	Synchros
18.	20	Fractional H.P. motors
19.	1	Transistor analyzer—Bricher
20.	1	Digital computer system
21.	2	Pulse generators
22.	4	Differential voltmeters, Fluke
23.	10	Digital student laboratory equipment units
24.	10	Micro-Wave student laboratory equipment units
25.	10	Servo systems student laboratory equipment units
26.	1	Micro-Wave Lecture—Demonstration unit
27.	1	Servo systems Lecture—Demonstration unit
28.	10	Vector breadboard kits
29.	10	Magnetic Amplifiers
30.	10	Integrated circuits kits
31.	20	Low voltage regulated DC supplies (channel mount)
32.	20	AC-DC variable supplies (channel mount)
33.	2	Set tools
34.	1	V O R
35.	2	Wheatstone bridge
36.	1	Navigation system
37.	2	Telemetering systems
38.	1	Generator test stand

Equipment for Communications Laboratory

The following equipment will provide for 20 student stations:

1.	10	Low voltage DC Supplies (channel mount)
2.	10	DC 0-400 volt. supplies (channel mount)

APPENDIX A (Cont'd)

Quantity		Type
3.	1	2kw DC Supply 500-1000-2000V on castors
4.	10	Variable 0-130VAC Supplies
5.	1	400 cycle 3 Phase 200 watt supply
6.	10	R F signal generators
7.	10	Audio Signal generators
8.	1	Monoscope with amplifiers and power supplies
9.	1	C W transmitter 50 watt 50-150 mc
10.	1	FM transmitter 250 watt
11.	1	TV transmitter 10kw
12.	1	Microwave communications system with related measuring equipments. (mount on a 10′ bench)
13.	1	50 watt audio amplifier with speakers
14.	6	Equipment racks
15.	1	Distribution amplifier
16.	1	Stabilizing amplifier
17.	1	Frequency reference
18.	1	Pulse generator
19.	1	Secondary frequency reference
20.	1	Communications receiver
21.	3	Regulated power supplies (for racks)

Equipment for Electrical Power Lab

The following equipment will provide 20 student stations:

1. 1 - 10 section switchboard 6′H x 24′W; 250A—120/208V Supply
2. 2 - MG Sets, 220V 3ø AC—240 V. D.C. (Noise Suppressed)
3. 2 - MG Sets, 220/440 3ø AC—120V D.C. 3KW (Special) Platform Mounted
4. 2 - MG Sets, 220/440 3ø AC—240V D.C. 3KW (Special) Platform Mounted

APPENDIX A (Cont'd)

Quantity	Type
5.	2 - 220V, 3ø A.C.S.C. Motor Starters, Rack Mounted
6.	2 - 440V, 3ø A.C.S.C. Motor Starters, Rack Mounted
7.	2 - 120V, D.C. Manual Motor Starters, Rack Mounted
8.	2 - 240V, D.C. Magnetic Motor Starters, Rack Mounted
9.	2 - 220V, 3ø A.C. Syn. Motor Starters, Rack Mounted
10.	2 - 440V, 3ø A.C. Syn. Motor Starters, Rack Mounted
11.	2 - 220V, 3ø A.C. WR Motor Starters, Rack Mounted
12.	2 - 440V, 3ø A.C. WR Motor Starters, Rack Mounted
13.	2 - 220V, 3ø A.C. Induction Regulator Controls Rack Mounted
14.	2 - 440V, 3ø A.C. Induction Regulator Controls Rack Mounted
15.	2 - 220V, 3ø A.C. Syn. Converter Controls, Rack Mounted
16.	2 - 440V, 3ø A.C. Syn. Converter Controls, Rack Mounted
17.	4 - 220V, 1ø A.C. Motor Starters, Rack Mounted
18.	2 - 220V, 3ø A.C. 15 H.P. 3 Unit MG Sets
19.	2 - 220V, 3ø A.C. 7.5 H.P. 3 Unit MG Sets
20.	2 - 240V, D.C. 2 unit MG sets
21.	2 - 220V, 3ø A.C.—Low Voltage High Current D.C. MG Sets
22.	2 - 220V, 3ø A.C.—Wound Rotor MG Sets
23.	5 - 220V, 3ø A.C. 5 H.P. Amplidyne MG Sets
24.	5 - 220V, 3ø A.C. 3 H.P. Amplidyne MG Sets
25.	5 - 220V, 3ø A.C. 1.5 H.P. Amplidyne MG Sets

APPENDIX A (Cont'd)

Quantity	Type
26.	2 - 220V, 3ø A.C. Syn. Motor MG Sets
27.	10 - 220V, D.C. 1/3 H.P. Motors
28.	10 - 220V, A.C. 1/3 H.P. 3ø Motors
29.	10 - 220V, A.C. 1/3 H.P. 1ø Motors
30.	5 - Thymotrol Controls with 1/2 H.P. Motors
31.	5 - Solid State Variable Controls with 1/2 H.P. Motors
32.	2 - Solid State Voltage Controls for 5 K.W. D.C.
33.	2 - Solid State Current Controls for 5 H.P. D.C.
34.	2 - Solid State Speed Controls for 5 H.P. D.C.
35.	2 - Reversing Magnetic Control Panels 5 H.P. D.C.
36.	2 - Reversing Magnetic Dynamic Lowering C.P. 5 H.P. D.C.
37.	2 - Loading Control Panels 5 H.P. D.C.
38.	2 - Reversing Drum Controls 5 H.P. D.C.
39.	2 - Reversing W. R. Drum Controls 5 H.P. 220V, 3ø A.C.
40.	2 - Reversing W. R. Counter Torque Controls 5 H.P. 220V, 3ø A.C.
41.	2 - Reversing W. R. Reactor Controls 5 H.P. 220V 3ø A.C.
42.	1 - Veneer Lathe Control Panel 5 H.P. 220V D.C.
43.	1 - Veneer Tray Follower Control Panel 5 H.P. 220V D.C.
44.	1 - Veneer Tipple Control Panel 1/6 H.P. 220V A.C.
45.	1 - Carriage Drive Control Panel 5 H.P. 220V D.C.
46.	2 - 3ø 220V Induction Voltage Regulators
47.	6 - 1ø 220V Induction Voltage Regulators
48.	4 - Diactor Type A.C.-D.C. Voltage Regulators
49.	1 - Process Control Unit

APPENDIX A (Cont'd)

Quantity	Type
50.	10 - 60 Amp. 150 ohm Load Banks
51.	10 - 30 Amp. 300 ohm Load Banks
52.	40 - Assorted 3 Terminal Rheostats
53.	24 - 50 Watt, 120—24V, 1ø Transformers with 86.6% Tap
54.	24 - 50 Watt, 120—24V, 1ø Transformers with 50% Tap
55.	12 - 1KW 220—440/120—240V Transformers, 1ø
56.	6 - 3KW 220—440/120—240V Transformers, 3ø
57.	4 - 300V—20 Amp. Variable D.C. Power Supplies 3ø F.W.
58.	4 - 250V—20 Amp. Variable D.C. Power Supplies 1ø F.W.
59.	2 - 220V 3ø Compensators, Transformer Type 10 H.P.
60.	2 - 220V 3ø Compensators, Resistance Type 10 H.P.
61.	2 - 220V 3ø Compensators, Reactor Type 10 H.P.
62.	5 - 120V D.C. Manual Starters
63.	10 - 220V D.C. Magnetic Starters (Assorted)
64.	20 - 110V A.C. Size O Magnetic Cross Line Starters
65.	20 - 220V A.C. Size O Magnetic Cross Line Starters
66.	10 - 110V A.C. Size O Reversing Mag. C. L. Starters
67.	10 - 220V A.C. Size O Reversing Mag. C. L. Starters
68.	10 - 120V D.C. Pneumatic Timers
69.	10 - 240V D.C. Pneumatic Timers
70.	10 - 120V A.D. Pneumatic Timers
71.	10 - 240V A.D. Pneumatic Timers

APPENDIX A (Cont'd)

Quantity	Type
72.	20 - 120V D.C. Control Relays (Assorted)
73.	20 - 240V D.C. Control Relays (Assorted)
74.	20 - 120V A.C. Control Relays (Assorted)
75.	20 - 240V A.C. Control Relays (Assorted)
76.	5 - Sets Low Voltage Lighting Controls
77.	20 - Solid State Dimmer Controls
78.	20 - SRC—25 Amp. Control Triodes
79.	40 - Assorted, Double Contact, Push Button Stations
80.	20 - 120V A.C. Pilot Lights
81.	20 - 240V A.C. Pilot Lights
82.	20 - 120V D.C. Pilot Lights
83.	20 - 240V D.C. Pilot Lights
84.	40 - Assorted, double Contact Limit Switches
85.	3 - D.C. Occiloscopes
86.	3 - A.C. Occiloscopes
87.	20 - Multimeters
88.	10 - A.C. Clamp On Ammeters
89.	10 - D.C. Clamp On Ammeters
90.	10 - Portable A.C. Voltmeters
91.	10 - Portable D.C. Voltmeters (Center Scale)
92.	10 - Portable AC Ammeters
93.	10 - Portable D.C. Ammeters (Center Scale)
94.	10 - Sets Assorted D.C. Shunts
95.	5 - A.C. Wattmeters—1ø
96.	5 - A.C. Phase Angle Indicators
97.	5 - A.C. Phase Rotation Indicators
98.	5 - 500V D.C. Meggers
99.	2 - High Potential Testers
100.	3 - Wheatstone Bridges
101.	3 - Capacitance Bridges
102.	3 - Inductance Bridges
103.	20 - Sets Portable Hand Tools

APPENDIX A (Cont'd)

Quantity	Type
104.	2 - 1/2″ Drill Motors
105.	10 - 1/4″ Drill Motors
106.	1 - Bench Mounted 1/4″ Drill Press
107.	1 - Bench Mounted Dual Wheel Grinder
108.	10 - Student Stations 24″ x 8′ with 30′ back. (Storage space)
109.	10 - Power Control Units (1 @ each station)
110.	2 - Work Benches 3′ x 10′ x 33″ H.
111.	2 - 4″ Machinists Vices
112.	2 - 4″ Pipe Vices
113.	2 - Sets 1/2″-3/4″ and 1″ Pipe Dies
114.	10 - Hack Saws
115.	4 - 1/2″ Hickeys
116.	4 - 3/4″ Hickeys
117.	4 - 1/2″ Tube Benders
118.	4 - 3/4″ Tube Benders
119.	4 - 5 H.P. Eddy Current Brakes
120.	4 - 5 H.P. Pony Brakes
121.	2 - 30″ Cross Cut Saws
122.	2 - 30″ Rip Saws
123.	10 - Claw Hammers
124.	2 - 24″ Levels
125.	10 - Soldering Irons
126.	10 - Soldering Guns
127.	5 - Tin Snips
128.	5 - Socket Wrenches
129.	5 - Sets Bearing Pullers
130.	5 - 10″ Pipe Wrenches
131.	5 - 18″ Pipe Wrenches
132.	5 - Braces
133.	5 - Reamers
134.	1 - Floor Mouned Buffer
135.	1 - Assorted Set Flat Files

APPENDIX A (Cont'd)

Quantity	Type
136.	1 - Assorted Set Rat Tail Files
137.	2 - 50′ Steel Tapes
138.	10 - 8′ Steel Tapes
139.	2 - 2′ Squares
140.	10 - Machinists 12″ Squares with level
141.	2 - Sets Assorted Screw Drivers
142.	2 - Sets Assorted Phillips Drivers
143.	10 - Sets Nut Drivers
144.	5 - Sets Steel Drills
145.	5 - Sets Wood Bits
146.	10 - 15 Amp. 2 Pole ACB's
147.	10 - 30 Amp. 2 Pole ACB's
148.	10 - 15 Amp. 3 Pole ACB's
149.	10 - 30 Amp. 3 Pole ACB's
150.	10 - 50 Amp. 3 Pole ACB's
151.	1 - Lot 1,000 Watt Resistors
152.	1 - Lot 200 Watt Resistors
153.	1 - Lot 50 Watt Resistors
154.	5 - Sets Assorted Punches
155.	5 - 24″ Crow Bars
156.	10 - Cold Chisels
157.	5 - Ball Peen Hammers
158.	10 - Composition Mallets
159.	2 - 5 H.P. 220V 3ø Hysteresis Motors
160.	10 - Assorted A.C. Induction Motors (For Breakdown)
161.	10 - Assorted D.C. Motors (For Breakdown)
162.	2 - 2 lb. Copper Sledge Hammers
163.	2 - 2 lb. Steel Sledge Hammers
164.	5 - 1ø Power Factor Meters
165.	5 - 3ø Power Factor Meters
166.	5 - A. C. Wattmeters—3ø
167.	1 - 2 Wheel hand truck

APPENDIX A (Cont'd)

Quantity	Type
168.	1 - Vertical lift hand truck 500 lb. 3′ lift
169.	4 - 24″ x 30″ Caster Mounted Benches (Portable)
170.	2 - Fractional H.P. Lathe—Armature Undercutter
171.	1 - Bake Oven
172.	1 - Dip Tank
173.	1 - Space for 10—Double Student Stations, 4 - Permanently mounted MG Sets, 1—Swbd, 2—Work benches and additional 500 sq. ft. for portable floor mounted equipment.

Equipment for Electronics Instruments Laboratory

The following equipment will provide 20 student stations:

8	Instrument Benches with Lights
6	Instrument Cabinets
1	Benchpower Supply
1	Audio Oscillator
1	Calvanomenter
1	Decade Capacitance Standard
1	Optical Dyrometer 8630
1	D.C. Wheatstone Bridge
3	1/4″ Electric Drill Motors
2	3/8″ Electric Motors
1	Hydraulic Steering-Unit
1	Pulse—Dot Soldering System
1	Vacuum Chamber
2	Machine Lathes
1	Strobo—Tac.
2	Megohms—Vibrotest Model 2850
1	Microamps A.C.—D.C. Hypot
3	Heat—Kit Oscilloscope
1	Industrial Oven

APPENDIX A (Cont'd)

Quantity	Type
1	Type 561.A Oscilloscope
1	Battery Eliminator
2	Vacuum Pumps
1	Mercury Manometer
1	Water Manometer
1	Hydraulic Press
1	Stand Grinder
1	Table Grinder
1	Welding Outfit
1	Floor Type Drill Press
1	Electric Soldering Iron Small Tool and Material
1	Milling Machine
1	Type Cutting and Flaring Tool
1	Heat Treating Furnaces
1	Hardness Tester
1	Dead Weight
1	200—Amp. Welding Machine
	Equipment for Clean Room Area
1	Clean Room
1	Vacuum System
1	Clean Bench
3	Stereo Magnifier
1	Levin Instrument Lathe
4	Stereomicroscopes
1	Weather Recorder
3	Vacuum Tube Voltmeter
1	Differential A.C.-D.C. Voltmeter
1	Hewlett and Packard Oscilloscope Model 120-B
18	Ohm Meters
1	Magnet Charger
1	Magnet Treater
1	Temperature Test Chamber

APPENDIX A (Cont'd)

Quantity	Type
18	Micro Soldering Irons
1	Flex—Shaft Motor
1	Electric Soldering Iron Small Tools and Materials
1	Small Centrifuge
1	Basic Photo Etching Equipment
1	Speedomax Hand W Recorder
1	Volt Box
1	Universal Potentiometer
1	Temperature Potentiometer
1	Resistance Box
1	Six Dial Double Ratio Box
10	D.C. Resistance Standards
1	Precision Bridge—D.C.
1	Resistance Temperature Bridge D.C.
1	Standard Cell Comparator
1	Mueller Bridge

Watch Repair Shop

The following equipment will provide 25 student stations:

Quantity	Type
18	Lathes
18	Watch Benches with Lights
2	Safes
3	Watch Cleaning Machine
2	Ultrasonic Instrument Cleaners
2	Vibrograph Machines
2	Tik-o-Print Machines
1	Scale
1	Demacnetizer
1	Crystal Cabinet
1	Air Compressor
1	Water Proof Tester
18	Staking Sets
1	Engraving Machine

APPENDIX A (Cont'd)

Quantity	Type
1	Ultrasonic Cleaning Machine Watch Master
1	L and R Ultrasonic Cleaning Machine
1	Levin Drill Press
2	Jeweling Sets
2	Stereo Scopes
1	Flex Shaft Drill Motor
1	Escapement Mock-Up
1	Hairspring Vibrator
1	Planting Outfit
1	Buffing Machine
3	Poising Tools
1	Electric Soldering Iron Small Tools and Materials

Equipment for Appliance Repair Shop

The following equipment will provide 20 student stations:

6	Automatic Washers
4	Electric Ranges
4	Automatic Dryers
2	Hot Water Tanks
4	Refrigerators
10	Student Laboratory Refrigeration Units
10	Basic Electricity Laboratory Kits
10	Prestolite Torch Kits
10	Temperature Recorders
10	Voltmeters—Clamp-on A.C.
5	Demonstrator Panels—Refrigeration, Washers, Circuits, and Components
1	Aramature Turning Lathe
1	Parts Cleaners
2	Gas Leakage Indicators
10	Ammeters
1	Drill Press

APPENDIX A (Cont'd)

Quantity	Type
3	Grinders
1	Appliance Hand Truck
10	Volt—Ohm—Milliameters
10	Bench Vises
4	Display Panels
1	Set Tools (approximately 2,000 pieces assorted small power and hand tools)

Equipment for Electromechanical Shop

The following equipment will provide for 20 student stations:

10	VOM Meters
10	Student Laboratory Electricity Kits
10	Electric Typewriters
4	Electric Adding Machines
2	Electric Calculators
2	Soft Drink Vending Machines
40	Relays
20	Assorted Switch Assemblies
10	Tool Sets
10	Electro-Mechanical Servo Systems

Equipment for Work Shop

1	Drill Press (1/2)
1	Metal Lathe
1	Bending Brake
2	Grinder
2	Drill Motors (1/4 and 1/2)
2	Work Benches
1	Set Assorted Small Tools
1	Table Saw with Jointer
2	Bench Vises
2	Hand Vises
1	Punchpress
1	Band Saw
1	Spot Welder

APPENDIX B

LIST OF COMMITTEES, CONSULTANTS AND COMMITTEE MEMBERS

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APPENDIX B (Cont'd)

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Mr. Charles Carpenter
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APPENDIX B (Cont'd)

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APPENDIX B (Cont'd)

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Mr. George Graff
Mr. Earl Weber

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APPENDIX B (Cont'd)

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